

#3116E

DRINKING WATER SURVEILLANCE PROGRAM

**CHAPLEAU
WATER TREATMENT
PLANT**

REPORT FOR 1991 AND 1992

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**CHAPLEAU WATER TREATMENT PLANT
DRINKING WATER SURVEILLANCE PROGRAM
REPORT FOR 1991 AND 1992**

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PIBS 3116

EXECUTIVE SUMMARY

DRINKING WATER SURVEILLANCE PROGRAM

CHAPLEAU WATER TREATMENT PLANT 1991 AND 1992 REPORT

The Drinking Water Surveillance Program (DWSP) for Ontario is a monitoring program providing immediate, reliable, current information on drinking water quality. The DWSP officially began in April 1986 and is designed to include all municipal supplies in Ontario. In 1991, 96 supplies and in 1992, 109 supplies were being monitored.

The Chapleau water treatment plant is a conventional treatment plant which treats water from the Chapleau river. The process consists of coagulation, flocculation, clarification (upflow clarifier) filtration, pH adjustment and disinfection. Ammonia is used in the disinfection process to convert free chlorine to a combined (chloramine) residual. This plant has a design capacity of $5.4 \times 1000 \text{ m}^3/\text{day}$. The Chapleau water treatment plant serves a population of approximately 2,500.

Water at the plant and at one location in the distribution system was sampled for the presence of approximately 180 parameters. Parameters were divided into the following groups: bacteriological, inorganic and physical (laboratory chemistry, field chemistry and metals), organic (chloroaromatics, chlorophenols, pesticides and PCB, phenolics, polyaromatic hydrocarbons and volatiles) and radiological (radionuclides). Most laboratory analyses were conducted at the Ministry of the Environment and Energy facilities in Rexdale, Ontario. Radionuclides were analyzed by the Ministry of Labour.

Table A is a summary of all results by group.

No known health related guidelines were exceeded.

The Chapleau water treatment plant, for the sample years 1991 and 1992, produced good quality water. The water in the distribution system was aesthetically affected by the water mains as was evidenced by the increase in colour and iron.

TABLE A
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHAPLEAU WTP

SUMMARY TABLE BY SCAN

A POSITIVE VALUE DENOTES THAT THE RESULT IS GREATER THAN THE STATISTICAL LIMIT OF DETECTION AND IS QUANTIFIABLE
A "-" INDICATES THAT NO SAMPLE WAS TAKEN

SCAN	SITE		RAW		TREATED		LANSODOME ST S	
	TESTS	%POSITIVE	TESTS	%POSITIVE	TESTS	%POSITIVE	TESTS	%POSITIVE
BACTERIOLOGICAL	42	27	64	13	4	30	12	6
CHEMISTRY (FIELD)	48	48	100	96	84	87	90	80
CHEMISTRY (LABORATORY)	360	300	83	369	290	78	521	492
METALS	384	110	28	383	96	25	598	242
CHLOROPAROMATICS	150	0	0	150	0	0	139	0
CHLOROPHENOLS	64	0	0	64	0	0	-	-
PESTICIDES AND PCB	382	0	0	381	1	0	222	0
PHENOLICS	16	1	6	16	4	25	-	-
POLYAROMATIC HYDROCARBONS	85	0	0	68	0	0	51	0
SPECIFIC PESTICIDES	74	0	0	74	0	0	-	-
VOLATILES	478	0	0	478	29	6	418	18
RADIONUCLIDES	35	5	14	28	4	14	-	-
TOTAL	2,118	491	2,120	512	2,051	838		

DRINKING WATER SURVEILLANCE PROGRAM

CHAPLEAU WATER TREATMENT PLANT 1991 AND 1992 REPORT

INTRODUCTION

The Drinking Water Surveillance Program (DWSP) for Ontario is a monitoring program providing immediate, reliable, current information on drinking water quality. The DWSP officially began in April 1986 and is designed to include all municipal supplies in Ontario. In 1991, 96 supplies and in 1992, 109 supplies were being monitored.

Appendix A has a full description of the DWSP.

The DWSP was initiated for the Chapleau water treatment plant in April 1991. This is the first published DWSP report.

PLANT DESCRIPTION

The Chapleau water treatment plant is a conventional treatment plant which treats water from the Chapleau river. The process consists of coagulation, flocculation, clarification (upflow clarifier) filtration, pH adjustment and disinfection. Ammonia is used in the disinfection process to convert free chlorine to a combined (chloramine) residual. This plant has a design capacity of $5.4 \times 1000 \text{ m}^3/\text{day}$. The Chapleau water treatment plant serves a population of approximately 2,500.

The sample day flows ranged from $0.46 \times 1000 \text{ m}^3/\text{day}$ to $2.1 \times 1000 \text{ m}^3/\text{day}$.

General plant information is presented in Table 1 and a schematic of plant processes, chemical addition points and sampling locations in Figure 1.

SAMPLING AND ANALYSES

Stringent DWSP sampling protocols were followed to ensure that all samples were collected in a uniform manner (see Appendix B).

Sample lines in the plant were flushed prior to sampling to ensure that the water obtained was indicative of its origin and not residual water standing in the sample line.

Attempts were made to capture the same block of water at each sampling point by taking the retention time into consideration. Retention time was calculated by dividing the volume of water between two sampling points by sample day flow. For example, if it was determined that retention time within the plant was five hours, then there would be a five hour interval between the raw and treated sampling. Similarly, if it was estimated that it took approximately one day for the water to travel from the plant to the distribution system site, this site would be sampled one day after the treated water from the plant.

To obtain a representative raw water sample, free from any added chemicals, at plants which used chlorine for zebra mussel control, the operator was required to turn off the chlorine feed to the mouth of the intake and allow enough time for the chlorinated water to clear from the intake works.

Plant operating personnel routinely analyzed parameters for process control (Table 2).

At all distribution system locations, two types of samples were obtained, a standing and a free flow. The standing sample consisted of water that had been in the household plumbing and service connection for a minimum of six hours. These samples were used to make an assessment of the change in the levels of inorganic compounds and metals due to leaching from, or deposition on, the plumbing system. The only analyses carried out on the standing samples, therefore, were laboratory chemistry and metals. The free flow sample represented fresh water from the distribution system main, since the sample tap was flushed for five minutes prior to sampling.

Water at the plant and at one location in the distribution system was sampled for the presence of approximately 180 parameters. Parameters were divided into the following groups: bacteriological, inorganic and physical (laboratory chemistry, field chemistry and metals), organic (chloroaromatics, chlorophenols, pesticides and PCB, phenolics, polyaromatic hydrocarbons and volatiles) and radiological (radionuclides). Most laboratory analyses were conducted at the Ministry of the Environment and Energy facilities in Rexdale, Ontario. Radionuclides were analyzed by the Ministry of Labour.

RESULTS

Field measurements were recorded on the day of sampling and were entered onto the DWSP database as submitted by plant personnel.

Table 3 contains information on delay time between the raw and treated water sampling, flow rate, and treatment chemical dosages.

Table 4 is a summary of all results by parameter and by water type. If a parameter was not detected, the total number of negative sample results is given. In contrast, if a parameter was detected at any location, the detailed results for all samples are provided.

Positive denotes that the result is greater than the statistical limit of detection established by the Ministry of the Environment and Energy laboratory staff and is quantifiable. Trace (<T) denotes that the level measured is greater than the lowest value detectable by the method but lies so close to the detection limit that it cannot be confidently quantified.

Table 5 lists all parameters analyzed in the DWSP.

Associated guidelines and detection limits are also supplied on Tables 4 and 5. Parameters are listed alphabetically within each scan.

DISCUSSION

GENERAL

Water quality was judged by comparison with the Ontario Drinking Water Objectives publication (ODWOs). When an Ontario Drinking Water Objective (ODWO) was not available, guidelines/limits from other agencies were used. These guidelines were obtained from the Parameter Listing System database.

The guidelines are evaluated on the results from the free flowing samples. Standing samples in the distribution system can show elevated concentrations in certain metals if the water is corrosive or if the standing time is excessive. Flushing the tap until the water achieves the coolest temperature will ensure that the water used for consumption will contain minimum concentrations of metals.

IN THIS REPORT, DISCUSSION IS LIMITED TO:

- THE TREATED AND DISTRIBUTED WATER;
- ONLY THOSE PARAMETERS WITH CONCENTRATIONS ABOVE GUIDELINE VALUES; AND
- POSITIVE ORGANIC PARAMETERS DETECTED.

BACTERIOLOGICAL

Guidelines for bacteriological sampling and testing of a supply are developed to maintain a proper supervision of its bacteriological quality. Routine monitoring programs usually require that multiple samples be collected in a given system. Full interpretation of bacteriological quality cannot be made on the basis of single samples. Standard plate count was the only bacteriological analysis conducted on the treated and distributed water.

Standard plate count is a test used to supplement routine analysis for coliform bacteria. The limit for standard plate count (at 35°C after 48 hours) in the ODWOs is 500 counts/mL (based on a geometric mean of 5 or more samples). DWSP bacteriological analysis of treated and distributed water was limited to standard plate count.

Standard plate count (membrane filtration) exceeded the ODWO Aesthetic Objective of 500 counts/mL in 3 of 28 treated and distributed water samples with a maximum reported value of 2,400 counts/mL.

INORGANIC & PHYSICAL

CHEMISTRY (FIELD)

Field pH exceeded the ODWO Recommended Operational Guideline of 6.5-8.5 pH units in 2 of 24 treated and distributed water samples with a maximum reported value of 8.8 pH units.

It is desirable that the temperature of drinking water be less than 15°C. The palatability of water is enhanced by its coolness. A temperature below 15°C will tend to reduce the growth of nuisance organisms and hence minimize associated taste, colour, odour and corrosion problems. The temperature of delivered water may increase in the distribution system due to the warming effect of soil in late summer and fall and/or as a result of higher temperatures in the source water.

Field temperature exceeded the ODWO Aesthetic Objective of 15°C in 9 of 30 treated and distributed water samples with a maximum reported value of 24.0°C.

CHEMISTRY (LABORATORY)

Colour in drinking water may be due to the presence of natural or synthetic substances as well as certain metallic ions. Colour is measured in Hazen units (HZU).

Colour exceeded the ODWO Aesthetic Objective of 5 HZU in 1 of 16 treated and all 13 distributed water samples with a maximum reported value of 25.5 HZU.

Alkalinity was below the ODWO Recommended Operational Guideline of 30-500 mg/L in 15 of 29 treated and distributed water samples with a minimum reported value of 14.8 mg/L.

The ODWOs indicate that a hardness level of between 80 and 100 mg/L as calcium carbonate for domestic waters provides an acceptable balance between corrosion and encrustation. Water supplies with a hardness greater than 200 mg/L are considered poor and possess a tendency to form scale deposits and result in excessive soap consumption. Water supplies with low hardness and alkalinity levels

tend to be more aggressive and may cause corrosion problems in the distribution system.

Hardness was below the ODWO Recommended Operational Guideline of 80-100 mg/L in all 29 treated and distributed water samples with values ranging from 29.0 to 58.8 mg/L.

In treated and distributed water samples, a Langelier's index lower than -2.0 indicates that the water is aggressive and has a tendency to be corrosive.

The Langelier's index was reported at -2.03 in 1 of 29 treated and distributed water samples.

Ammonia is used in the disinfection process to convert free chlorine residual into a combined chlorine (chloramine), therefore the presence of slightly elevated ammonia levels in the treated and distributed water are expected.

The European Economic Community has a Maximum Admissible Concentration of 0.50 mg/L for total ammonium set as a result of the concern for potential sewage contamination of the raw water.

Total ammonium exceeded the European Economic Community Maximum Admissible Concentration of 0.5 mg/L in 6 of 29 treated and distributed water samples with a maximum reported value of 0.67 mg/L. The treatment plant was notified.

Total ammonium also exceeded the European Economic Community Aesthetic Guideline Level of 0.05 mg/L in another 23 treated and distributed water samples with a maximum reported value of 0.47 mg/L.

PH exceeded the ODWO Recommended Operational Guideline of 6.5-8.5 pH units in 1 of 29 treated and distributed water samples with a maximum reported value of 8.63 pH units.

Turbidity in water is caused by the presence of suspended matter such as clay, silt, colloidal particles, plankton and other microscopic organisms. The most important potential health effect of turbidity is its interference with disinfection in the treatment plant and the maintenance of a chlorine residual. The ODWO Maximum Acceptable Concentration for turbidity is 1.0 Formazin Turbidity Unit (FTU) and applies to the water leaving the treatment facility.

Turbidity exceeded the ODWO Maximum Acceptable Concentration of 1.0 FTU in 4 of 16 treated water samples with a maximum reported value of 1.55 FTU. These results were not confirmed by the corresponding and more reliable field turbidity results.

METALS

At present, there is no evidence that aluminum is physiologically harmful and no health limit for drinking water has been specified. The measure of aluminum in treated water is important to measure the efficiency of the treatment process. The ODWOs indicate that a useful guideline is to maintain a residual below 100 ug/L as aluminum in the water leaving the plant to avoid problems in the distribution system.

Aluminum exceeded the ODWO Recommended Operational Guideline of 100 ug/L in 18 of 29 treated and distributed water samples with a maximum reported value of 900 ug/L.

Iron exceeded the ODWO Aesthetic Objective of 300 ug/L in 9 of 13 distributed water samples with a maximum reported value of 890 ug/L.

Manganese, in high concentrations, can contribute to laundry staining and undesirable tastes.

Manganese exceeded the ODWO Aesthetic Objective of 50.0 ug/L in 1 of 29 treated and distributed water samples with a maximum reported value of 81.0 ug/L.

ORGANIC

CHLOROAROMATICS

The results of the chloroaromatic scan showed that none were detected above trace levels.

CHLOROPHENOLS

The results of the chlorophenol scan showed that one parameter was detected at a trace level in one treated water sample.

PESTICIDES AND PCB

Hexachlorocyclopentadiene was found at a positive level in 1 of the 10 treated and distributed water samples analyzed. The maximum observed level was 51.0 ng/L. This was below the United States Environmental Protection Agency Ambient Water Quality Criteria of 206,000 ng/L.

PHENOLICS

Phenolic compounds are present in the aquatic environment as a result of natural and/or industrial processes. The ODWOs have been revised to replace the aesthetic phenolic objective with objectives for specific phenols.

Phenolics were found at positive levels in 4 of the 16 treated water samples analyzed. The maximum observed level was 1.8 ug/L.

POLYAROMATIC HYDROCARBONS

The results of the polyaromatic hydrocarbon scan showed that none were detected.

SPECIFIC PESTICIDES

The results of the specific pesticide scan showed that none were detected.

VOLATILES

The detection of benzene, ethylbenzene, toluene and xylenes at low, trace levels may be a laboratory artifact derived from the analytical methodology. Trace levels of styrene are considered to be laboratory artifacts resulting from the sample shipping containers.

Trihalomethanes (THMs) are produced during the water treatment process and will always occur in chlorinated waters. THMs are comprised of chloroform, chlorodibromomethane and dichlorobromomethane. Bromoform occurs occasionally. Results are reported for the individual compounds as well as for total THMs. Only total THM results are discussed. Starting in 1991, samples from the distribution system were quenched with sodium thiosulphate to stop the further production of THMs in the sample bottle. This provided a more representative estimation of the THMs consumed in tap water.

Total trihalomethanes were found at positive levels in 17 of 29 treated and distributed water samples analyzed. The maximum observed level was 36.15 ug/L. This was below the ODWO Maximum Acceptable Concentration of 350 ug/L.

RADIOLOGICAL

RADIONUCLIDES

There are more than 200 radionuclides, some of which occur naturally and others which originate from the activities of society. The radionuclides currently of greater interest from a health view-point are tritium, strontium-90, iodine-131, cesium-137 and radium-226. The gross beta and gross alpha determinations are suitable for preliminary screening except for tritium which must be measured separately. Radionuclides are measured in becquerels per litre (Bq/L). No results were above the available guidelines.

CONCLUSIONS

No known health related guidelines were exceeded.

The Chapleau water treatment plant, for the sample years 1991 and 1992, produced good quality water. The water in the distribution system was aesthetically affected by the water mains as was evidenced by the increase in colour and iron.

FIGURE 1 CHAPLEAU WATER TREATMENT PLANT

SCHEMATIC

CHARACTERISTICS

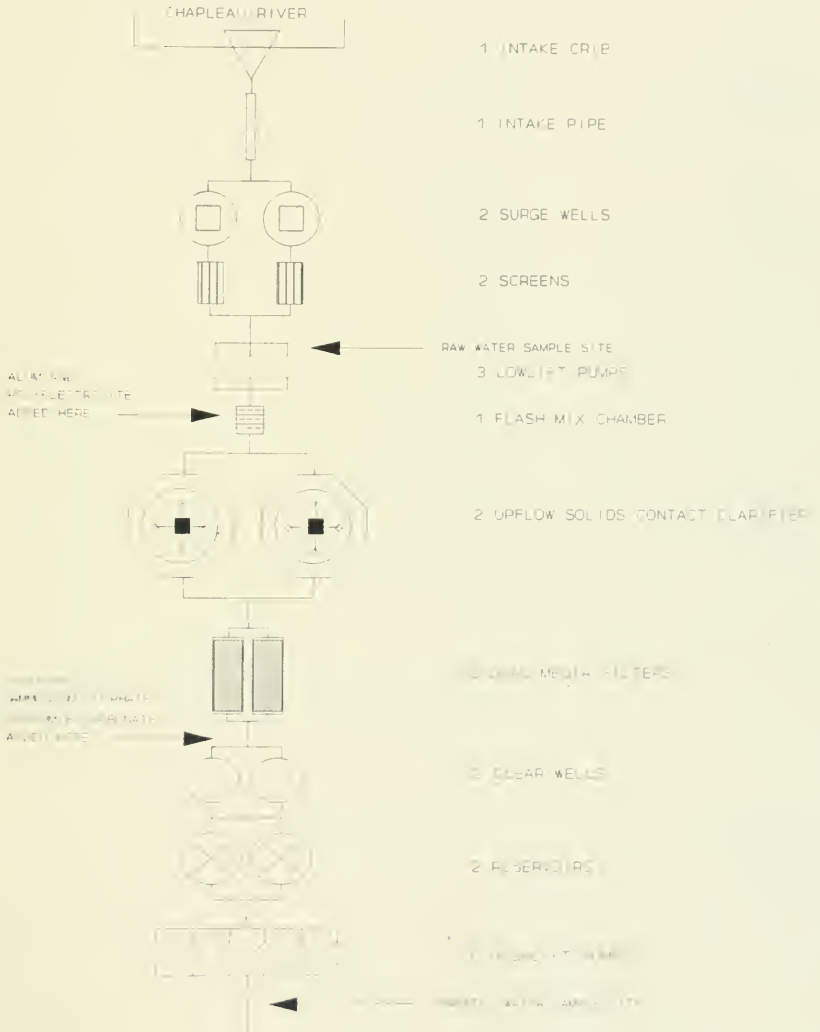


TABLE 1
DRINKING WATER SURVEILLANCE PROGRAM
PLANT GENERAL REPORT

PLANT NAME: CHAPLEAU WTP
WORKS #: 220003494
UTM #: 173209505301270

DISTRICT: TIMMINS
REGION: NORTHEAST
DISTRICT OFFICER: R. ROY

SUPERINTENDENT: G. BERTRAND

ADDRESS: 0 KING ST.
CHAPLEAU, ONTARIO
POM 1K0
705-864-0105

MUNICIPALITY: CHAPLEAU
AUTHORITY: PROVINCIAL

PLANT INFORMATION

PLANT VOLUME:	2.800	(X 1000 M3)
DESIGN CAPACITY:	5.450	(X 1000 M3/DAY)
RATED CAPACITY:	-	(X 1000 M3/DAY)

MUNICIPALITY	POPULATION
-----	-----
CHAPLEAU	2,450

TABLE 2
DRINKING WATER SURVEILLANCE PROGRAM
IN-PLANT MONITORING

PARAMETER -----	LOCATION -----	FREQUENCY -----
ALKALINITY	RAW TREATED	DAILY DAILY
ALUMINUM	RAW TREATED	WEEKLY WEEKLY
COMBINED CHLORINE RESIDUAL	TREATED	DAILY
COLOUR	RAW TREATED	DAILY DAILY
IRON RESIDUAL	RAW TREATED	WEEKLY WEEKLY
HARDNESS	RAW TREATED	DAILY DAILY
PH	RAW TREATED	DAILY DAILY
TEMPERATURE	RAW TREATED	DAILY DAILY
TURBIDITY	RAW TREATED	DAILY DAILY

TABLE 3
DRINKING WATER SURVEILLANCE PROGRAM CHAPLEAU WTP SAMPLE DAY CONDITIONS
AND TREATMENT CHEMICAL DOSAGES FOR 1991 AND 1992

DATE	DELAY * TIME(HRS)	FLOW (100DM3)	COAGULATION ALUM LIQUID	POST CHLORINATION CHLORINE	CHLORINATION AMMONIUM SULPHATE	COAGULATION AID POLYELECTROLYTE	ALKALINITY ADJUSTMENT SODIUM HYDROXIDE
91 APR 19	00	1.264	70.00	1.63	2.03	1.20	19.36
91 MAY 28	3.90	1.382	74.00	2.05	2.92	.20	22.31
91 JUN 24	00	.	.	.	.	.	.
91 JUL 23	28.00	1.460	56.39	2.40	1.00	.05	16.37
91 AUG 26	33.00	1.434	53.98	2.21	2.12	.50	13.26
91 SEP 23	15.50	1.534	.	.	.	.	.
91 OCT 29	11.00	1.667	71.95	7.36	3.39	.05	20.32
91 DEC 04	8.00	1.486	40.56	1.92	3.51	.	14.65
92 JAN 28	00	1.000	58.83	1.25	2.76	.	15.40
92 FEB 25	8.00	2.117	56.94	1.56	2.26	.	18.29
92 MAR 24	17.50	1.216	74.30	1.50	2.86	.	13.93
92 APR 27	17.10	1.796	67.11	.86	1.45	.	16.17
92 MAY 26	16.10	1.628	55.53	1.62	1.60	.	11.89
92 JUL 28	18.40	2.031	59.32	1.03	1.71	.	14.29
92 SEP 29	16.80	1.444	76.52	1.10	1.98	.	15.08
92 NOV 24	14.10	1.691	71.28	.61	1.28	.	12.87

* THE DELAY TIME BETWEEN THE RAW AND TREATED WATER SAMPLING, SHOULD ESTIMATE THE RETENTION TIME.

KEY TO TABLE 4 and 5

- A ONTARIO DRINKING WATER OBJECTIVES (ODWO)
1. Maximum Acceptable Concentration (MAC)
 - 1+. MAC for Total Trihalomethanes
 2. Interim Maximum Acceptable Concentration (IMAC)
 3. Aesthetic Objective (AO)
 - 3*. AO for Total Xylenes
 4. Recommended Operational Guideline
 5. Health Related Guidance Value
- B HEALTH & WELFARE CANADA (H&W)
1. Maximum Acceptable Concentration (MAC)
 2. Proposed MAC
 3. Interim MAC
 4. Aesthetic Objective (AO)
- C WORLD HEALTH ORGANIZATION (WHO)
1. Guideline Value (GV)
 2. Tentative GV
 3. Aesthetic GV
- D US ENVIRONMENTAL PROTECTION AGENCY (EPA)
1. Maximum Contaminant Level (MCL)
 2. Suggested No-Adverse Effect Level (SNAEL)
 3. Lifetime Health Advisory
 4. EPA Ambient Water Quality Criteria
- F EUROPEAN ECONOMIC COMMUNITY (EEC)
1. Health Related Guideline Level
 2. Aesthetic Guideline Level
 3. Maximum Admissable Concentration (MADC)
- G CALIFORNIA STATE DEPARTMENT OF HEALTH-GUIDELINE VALUE
- I NEW YORK STATE AMBIENT WATER GUIDELINE
- N/A NONE AVAILABLE

LABORATORY RESULTS, REMARK DESCRIPTIONS

. No Sample Taken

BDL Below Minimum Measurement Amount

<T Greater Than Detection Limit But Not Confident
(SEE INTERPRETATION OF RESULTS ABOVE)

> Results Are Greater Than The Upper Limit

<=> Approximate Result

!48 No Data: Sample Age Exceeded 48 Hours

!AR No Data: No Numeric Results

!AW No Data: Analysis Withdrawn

!BT No Data: Sample Broken In Transit

!CS No Data: Contamination Suspected

!EF No Data: Laboratory Equipment Failure

!IR No Data: Insufficient Sample

!IS No Data: Insufficient Sample

!LA No Data: Laboratory Accident

!NP No Data: No Procedure

!NR No Data: Sample Not Received

!OP No Data: Obscured Plate

!PE No Data: Procedure Error: Sample Discarded

!PR No Data: Preservative Required

!QU No Data: Quality Control Unacceptable

!RE No Data: Received Empty

!RO No Data: No Numeric Results

!SM No Data: Sample Missing

!SS No Data: Sample Improperly Preserved

!U No Data: Sample Unsuitable For Analysis

!UB No Data: Bottle Broken

!UN No Data: Result Unreliable

!UR	No Data: Unpreserved Sample Required
A	Approximate Value
A3C	Approximate, Total Count Exceeded 300 Colonies
A>	Approximate Value, Exceeded Normal Range
APS	Additional Peak, Less Than, Not Priority Pollutant
ARO	Additional Information In Laboratory Report
CRO	Calculated Result Only
NAF	Not All Required Tests Found
RID	Ioncal Calculated on Incomplete Data Set
RMP	P and M-Xylene Not Separated
RRR	Result Obtained by Repeat Analysis
RRV	Rerun Verification
SFA	Sample Filtered: Filtrate Analyzed
SIL	Sample Incorrectly Labelled
SPS	Several Peaks, Small, Not Priority Pollutant
U48	Unreliable: Sample Age Exceeded 48 Hours
UAL	Unreliable: Sample Age Exceeded Limit
UAU	Unreliable: Sample Age Unknown
UCS	Unreliable: Contamination Suspected
WSD	Wrong Sample Description On Bottle

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHAPLEAU WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM LANDSOMME ST S FREE FLOW	DIST. SYSTEM LANDSOMME ST S STANDING	
BACTERIOLOGICAL				
FECAL COLIFORM MF (CT/100ML)		DET'N LIMIT = 0	GUIDELINE = 0 (A1)	
1991 MAY	4			
1991 JUL	4			
1991 AUG	BDL			
1991 SEP	32			
1991 OCT	16			
1991 DEC	24			
1992 JAN	BDL			
1992 FEB	BDL			
1992 MAR	8			
1992 APR	4			
1992 MAY	BDL			
1992 JUL	4			
1992 SEP	4			
1992 NOV	BDL			
STANDARD PLATE CNT MF (CT/ML)				
		DET'N LIMIT = 0	GUIDELINE = 500 (A3)	
1991 MAY		2 <=>	36	
1991 JUN			880	
1991 JUL		61	1300	
1991 AUG		14		
1991 SEP		1 <=>	140	
1991 OCT		13	2 <=>	
1991 DEC		5 <=>	0 <=>	
1992 JAN		2 <=>	1 <=>	
1992 MAR		0 <=>	2 <=>	
1992 APR		3 <=>		
1992 MAY		1 <=>	2400	
1992 JUL		10	40	
1992 SEP		0 <=>	0 <=>	
1992 NOV		1 <=>	1 <=>	

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHAPLEAU WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM LANSDOUNE ST S FREE FLOW	DIST. SYSTEM LANSDOUNE ST S STANDING	GUIDELINE = 5/100ML (A1)
BACTERIOLOGICAL				
TOTAL COLIFORM MF (CT/100ML)		DET'N LIMIT = 0		
1991 MAY	90 <=>	-	-	-
1991 JUL	100 <=>	-	-	-
1991 AUG	80 <=>	-	-	-
1991 SEP	120 A3C	-	-	-
1991 OCT	180	-	-	-
1991 DEC	70 <=>	-	-	-
1992 JAN	50 <=>	-	-	-
1992 FEB	50 <=>	-	-	-
1992 MAR	30 <=>	-	-	-
1992 APR	210 A3C	-	-	-
1992 MAY	90 <=>	-	-	-
1992 JUL	40 <=>	-	-	-
1992 SEP	60 <=>	-	-	-
1992 NOV	150	-	-	-
T COLIFORM BCKGRO MF (CT/100ML)				
		DET'N LIMIT = 0		GUIDELINE = N/A
1991 MAY	3100 A3C	-	-	-
1991 JUL	40000 A3C	-	-	-
1991 AUG	24000 >	-	-	-
1991 SEP	8600 A3C	-	-	-
1991 OCT	2700	-	-	-
1991 DEC	370	-	-	-
1992 JAN	580	-	-	-
1992 FEB	320	-	-	-
1992 MAR	340	-	-	-
1992 APR	3100 A3C	-	-	-
1992 MAY	4100 A3C	-	-	-
1992 JUL	3500 A3C	-	-	-
1992 SEP	6100 A3C	-	-	-
1992 NOV	540	-	-	-

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHAPLEAU WTP

TREATMENT PLANT RAW	CHEMISTRY (FIELD)		DIST. SYSTEM FREE FLOW		DIST. SYSTEM STANDING	
	FLD CHLORINE (COMB) (MG/L)		DET'N LIMIT = 0		GUIDELINE = N/A	
1991 APR	.	1.400	.000	.	.200	.
1991 MAY	.	1.500	.300	.	.200	.
1991 JUN	.	.840	.	.	.000	.
1991 JUL	.	.800	.000	.	.000	.
1991 AUG	.	1.000	.	.	1.000	.
1991 SEP	.	1.500	.	.	.000	.
1991 OCT	.	1.100	.	.	.	.
1991 DEC	.	1.500	.400	.	.	.
1992 JAN	.	1.250	.200	.	.	.
1992 FEB	.	.950	.000	.	.	.
1992 MAR	.	1.500	1.800	.	.	.
1992 APR	.	1.020	.	.	.	.
1992 MAY	.	1.150	.	.	.800	.
1992 JUL	.	1.400	.	.	.200	.
1992 SEP	.	1.500	.400	.	.	.
1992 NOV	.	1.000	.	.	.000	.
FLD CHLORINE FREE (MG/L)			DET'N LIMIT = 0		GUIDELINE = N/A	
1991 APR	.	.000	.000	.	.	.
1991 MAY	.	.080	.100	.	.100	.
1991 JUN	.	.020	.	.	.200	.
1991 JUL	.	.200	.200	.	.000	.
1991 AUG	.	.100	.	.	.	.
1991 SEP	.	.000	.	.	.200	.
1991 OCT	.	.000	.	.	.200	.
1991 DEC	.	.000	.400	.	.	.
1992 JAN	.	.000	.200	.	.	.
1992 FEB	.	.000	.200	.	.	.
1992 MAR	.	.000	.200	.	.	.
1992 APR	.	.000	.	.	.	.
1992 MAY	.	.000	.	.	.200	.
1992 JUL	.	.000	.	.	.200	.
1992 SEP	.	.000	.200	.	.	.
1992 NOV	.	.000	.	.	.200	.

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHAPLEAU WTP

TREATMENT PLANT		TREATMENT PLANT	DIST. SYSTEM		DIST. SYSTEM	
RAW		TREATED	LANSDOWNE ST S	LANSDOWNE ST S	LANSDOWNE ST S	LANSDOWNE ST S
			FREE FLOW	STANDING		
CHEMISTRY (FIELD)						
FLO CHLORINE (TOTAL) (MG/L)			DET'N LIMIT = 0		GUIDELINE = N/A	
1991 APR	-	1.400	.000	-	-	-
1991 MAY	-	1.580	.400	.300	-	.300
1991 JUN	-	.860	-	.400	-	.400
1991 JUL	-	.750	.200	.000	-	.000
1991 AUG	-	1.100	-	-	-	-
1991 SEP	-	1.500	-	1.200	-	1.200
1991 OCT	-	1.100	-	.200	-	.200
1991 DEC	-	1.500	.800	-	-	-
1992 JAN	-	1.250	.400	-	-	-
1992 FEB	-	.950	.200	-	-	-
1992 MAR	-	1.500	2.000	-	-	-
1992 APR	-	1.020	-	-	-	-
1992 MAY	-	1.150	-	1.000	-	1.000
1992 JUN	-	1.400	-	.400	-	.400
1992 SEP	-	1.500	.600	-	-	-
1992 NOV	-	1.000	-	.200	-	.200

FLO PH (DIMENSIONLESS)			DET'N LIMIT = N/A		GUIDELINE = 6.5-8.5 (A4)	
1991 APR	6.700	6.900	6.800	-	-	-
1991 MAY	7.400	8.800	7.400	7.200	-	7.200
1991 JUN	7.100	7.200	7.200	-	-	-
1991 JUL	7.600	8.000	-	7.400	-	7.400
1991 AUG	7.200	7.700	-	-	-	-
1991 SEP	7.200	7.200	7.200	-	-	-
1991 OCT	7.100	6.900	6.800	-	-	-
1991 DEC	7.100	7.100	-	-	-	-
1992 JAN	7.100	7.100	-	7.000	-	7.000
1992 FEB	7.200	8.600	-	7.000	-	7.000
1992 MAR	7.200	8.100	-	7.200	-	7.200
1992 APR	7.100	6.800	-	7.600	-	7.600
1992 MAY	6.900	7.800	7.000	-	-	-
1992 JUN	7.400	7.800	7.000	-	-	-
1992 JUL	7.300	7.400	7.400	-	-	-
1992 SEP	7.300	7.400	-	7.200	-	7.200
1992 NOV	6.400	6.800	6.800	-	-	-

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHAPLEAU WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM LANSOWNE ST FREE FLOW	DIST. SYSTEM LANSOWNE ST STANDING	
CHEMISTRY (FIELD)				
FLO TEMPERATURE (DEG.C)		DET'N LIMIT = N/A	GUIDELINE = 15 (A3)	
1991 APR	2.000	3.000	.500	.
1991 MAY	19.500	19.500	7.600	.
1991 JUN	23.000	22.800	17.000	17.000
1991 JUL	24.000	24.000	16.000	16.000
1991 AUG	21.000	21.500	.	.
1991 SEP	14.200	15.800	15.000	15.000
1991 OCT	7.500	9.000	10.000	10.000
1991 DEC	3.600	4.400	6.000	6.000
1992 JAN	1.700	1.700	3.000	3.000
1992 FEB	4.400	5.900	.200	.200
1992 MAR	5.000	6.300	.200	2.000
1992 APR	4.900	5.500	.	.
1992 MAY	15.200	16.100	10.000	10.000
1992 JUL	20.900	21.500	13.000	13.000
1992 SEP	14.000	14.900	12.000	12.000
1992 NOV	5.100	6.100	7.000	7.000
FLO TURBIDITY (FTU)		DET'N LIMIT = N/A	GUIDELINE = 1.0 (A1)	
1991 APR	2.100	.890	.	.
1991 MAY	1.100	.340	.	.
1991 JUN	1.000	.290	.	.
1991 JUL	1.000	.170	.	.
1991 AUG	1.200	.250	.	.
1991 SEP	1.400	.120	.	.
1991 OCT	1.100	.630	.	.
1991 DEC	.800	.600	.	.
1992 JAN	.600	.340	.	.
1992 FEB	.800	.250	.	.
1992 MAR	.930	.210	.	.
1992 APR	.750	.600	.	.
1992 MAY	.700	.740	.	.
1992 JUL	.950	.650	.	.
1992 SEP	1.000	.130	.	.
1992 NOV	.800	.550	.	.

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHAPLEAU WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM LANSDOWNE ST S FREE FLOW	DIST. SYSTEM LANSDOWNE ST S STANDING
CHEMISTRY (LABORATORY)			
ALKALINITY (MG/L)	DET'N LIMIT = 0.2		GUIDELINE = 30-500 (A4)
1991 APR	21.700	17.200	
1991 MAY	44.000	43.500	44.100
1991 JUN	36.300	25.600	27.800
1991 JUL	37.400	30.000	29.200
1991 AUG	43.200	34.800	
1991 SEP	48.200	37.700	37.000
1991 OCT	34.600	19.700	16.900
1991 DEC	33.700	24.300	25.600
1992 JAN	37.800	28.700	31.100
1992 FEB	41.000	42.300	39.700
1992 MAR	44.300	45.200	43.300
1992 APR	25.900	14.900	
1992 MAY	27.800	14.800	21.100
1992 JUN	40.600	29.000	27.900
1992 JUL	47.500	33.700	34.400
1992 SEP		15.100	15.100
1992 NOV	35.400		
CALCIUM (MG/L)	DET'N LIMIT = 0.20		GUIDELINE = 100 (F2)
1991 APR	9.200	9.000	
1991 MAY	17.400	17.600	18.000
1991 JUN	13.000		13.800
1991 JUL	12.200	11.400	11.000
1991 AUG	14.400		
1991 SEP	15.800	15.600	16.000
1991 OCT	12.600	18.500	18.200
1991 DEC	12.800	11.800	13.000
1992 JAN	12.900	13.300	13.200
1992 FEB	13.800	13.900	12.700
1992 MAR	14.800	14.800	13.700
1992 APR	9.450	10.400	
1992 MAY	9.400	13.200	14.700
1992 JUL	13.700	13.200	13.800
1992 SEP	15.150	15.400	15.900
1992 NOV	11.650	11.700	12.300
CYANIDE (MG/L)	DET'N LIMIT = 0.001		GUIDELINE = 0.2 (A1)
24. SAMPLES	BOL	BOL	

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHAPLEAU WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM LANSDOWNE ST S FREE FLOW	DIST. SYSTEM LANSDOWNE ST S STANDING	CHEMISTRY (LABORATORY)	
				CHLORIDE (MG/L)	COLOUR (HZU)
				DET'N LIMIT = 0.20	GUIDELINE = 250 (A3)
1991 APR	1.700	3.100	3.400	4.400	
1991 MAY	1.200	3.800	4.400	3.400	
1991 JUN	1.900	3.300		2.500	
1991 JUL	2.400	3.900	2.400	5.300	
1991 AUG	2.500	5.500		4.000	
1991 SEP	2.600	5.200		4.700	
1991 OCT	2.100	3.800		4.000	
1991 DEC	2.200	4.600		2.300	
1992 JAN	2.100	3.900		4.700	
1992 FEB	2.000	2.900		5.300	
1992 MAR	2.100	4.500		3.900	
1992 APR	1.700	3.200		4.400	
1992 MAY	1.500	3.000		3.400	
1992 JUL	2.200	3.700			
1992 SEP	2.300	4.300			
1992 NOV	2.200	3.300			
				DET'N LIMIT = 0.50	GUIDELINE = 5 (A3)
1991 APR	79.500	3.000	15.500	16.500	
1991 MAY	64.000	3.500	25.500	10.500	
1991 JUN	65.000	5.000		9.500	
1991 JUL	58.500	5.000	12.000		
1991 AUG	40.000	4.500		7.500	
1991 SEP	35.000	3.500	9.000	10.000	
1991 OCT	76.000	4.000	14.000	14.000	
1991 DEC	72.500	4.000	15.500	8.500	
1992 JAN	55.500	3.000	12.000	9.000	
1992 FEB	51.000	3.500	10.000	8.000	
1992 MAR	42.500	3.500	7.000		
1992 APR	81.000	2.500			
1992 MAY	71.000	4.500	10.000	7.000	
1992 JUL	56.500	9.000	14.500	13.000	
1992 SEP	46.000	3.000	8.000	7.000	
1992 NOV	71.000	3.000	7.000	8.000	

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHAPLEAU WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	CHEMISTRY (LABORATORY) CONDUCTIVITY (UMHO/CM)	DIST. SYSTEM LANSDOWNE ST S		DIST. SYSTEM LANSDOWNE ST S	
			FREE FLOW	STANDING	FREE FLOW	STANDING
			DET'N LIMIT = 1.0		GUIDELINE = 400 (F2)	
1991 APR	66	148	156			
1991 MAY	77	143	140			145
1991 JUN	89	147				155
1991 JUL	88	144	140			142
1991 AUG	98	154				
1991 SEP	110	158				
1991 OCT	86	156	157			159
1991 DEC	88	144	145			145
1992 JAN	96	149	143			143
1992 FEB	98	167	153			155
1992 MAR	104	164	162			164
1992 APR	69	124	166			166
1992 MAY	70	122				
1992 JUL	97	160	197			196
1992 SEP	107	171	161			163
1992 NOV	90	146	173			174
			145			147
			DET'N LIMIT = 0.10		GUIDELINE = 5.0 (A3)	
			DISS ORG CARBON (MG/L)			
1991 APR	11.200	3.300	3.100			
1991 MAY	9.700	2.900	3.000			3.000
1991 JUN	10.800	3.500				3.600
1991 JUL	10.400	4.300	3.900			4.100
1991 AUG	9.100	3.900				
1991 SEP	8.400	3.800				
1991 OCT	13.000	3.400	3.700			3.500
1991 DEC	11.400	3.400	3.100			3.100
1992 JAN	10.200	3.000	3.600			3.400
1992 FEB	8.700	3.000	2.800			2.900
1992 MAR	8.400	3.500	2.900			2.800
1992 APR	12.000	3.000	3.300			3.300
1992 MAY	10.500	3.100				
1992 JUL	10.200	4.200	3.300			3.000
1992 SEP	10.700	3.800	3.600			3.900
1992 NOV	10.800	3.100	2.600			3.600
						2.600

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHAPLEAU WTP

TREATMENT PLANT RAW		TREATMENT PLANT TREATED	DIST. SYSTEM LANDSDOWNE ST S FREE FLOW		DIST. SYSTEM LANDSDOWNE ST S STANDING	
CHEMISTRY (LABORATORY)						
FLUORIDE (MG/L)			DET'N LIMIT = 0.01		GUIDELINE = 1.5 (A1)	
1991 APR	.020 <T	.020 <T	.020 <T	.020 <T	.020 <T	.020 <T
1991 MAY	.020 <T	.020 <T	BOL	BOL	BOL	BOL
1991 JUN	.020	.020	.020	.020	.020	.020
1991 JUL	.020 <T	.020 <T	.020 <T	.020 <T	.020 <T	.020 <T
1991 AUG	.040 <T	.040 <T	.020 <T	.020 <T	.020 <T	.020 <T
1991 SEP	BOL	BOL	.020 <T	.020 <T	.020 <T	.020 <T
1991 OCT	.020 <T	.020 <T	.020 <T	.020 <T	.020 <T	.020 <T
1991 DEC	.020 <T	.020 <T	.020 <T	.020 <T	.020 <T	.020 <T
1992 JAN	.020 <T	.020 <T	BOL	BOL	BOL	BOL
1992 FEB	.020 <T	.020 <T	.020 <T	.020 <T	.020 <T	.020 <T
1992 MAR	.020 <T	.020 <T	.020 <T	.020 <T	.020 <T	.020 <T
1992 APR	.040 <T	.040 <T	.040 <T	.040 <T	.040 <T	.040 <T
1992 MAY	.040 <T	.040 <T	.040 <T	.040 <T	.040 <T	.040 <T
1992 JUN	.040 <T	.040 <T	BOL	BOL	BOL	BOL
1992 SEP	.020 <T	.020 <T	.020 <T	.020 <T	.020 <T	.020 <T
1992 NOV	.020 <T	.020 <T	BOL	BOL	BOL	BOL

HARDNESS (MG/L)			DET'N LIMIT = 0.5		GUIDELINE = 80-100 (A4)	
1991 APR	31.000	31.000	29.000	53.200	53.200	53.200
1991 MAY	53.100	54.000	52.400	45.000	45.000	45.000
1991 JUN	43.000	42.000	40.100	36.600	36.600	36.600
1991 JUL	40.800	40.100	38.000	52.600	52.600	52.600
1991 AUG	47.600	49.300	51.600	58.300	58.300	58.300
1991 SEP	52.000	51.300	58.800	44.300	44.300	44.300
1991 OCT	42.700	42.600	44.300	43.800	43.800	43.800
1991 DEC	44.200	41.400	43.900	42.000	42.000	42.000
1992 JAN	42.900	42.700	43.000	46.000	46.000	46.000
1992 FEB	46.000	47.000	47.000	49.000	49.000	49.000
1992 MAR	50.000	49.000	46.000	45.000	45.000	45.000
1992 APR	32.910	35.810	45.000	46.000	46.000	46.000
1992 MAY	32.000	33.000	44.000	53.100	53.100	53.100
1992 JUN	46.000	46.000	51.410	41.600	41.600	41.600
1992 JUL	46.000	46.000	42.000			
1992 SEP	51.070	51.620				
1992 NOV	40.200	40.100				

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHAPLEAU WTP

TREATMENT PLANT RAW		TREATMENT PLANT TREATED	DIST. SYSTEM LANSDOWNE ST S FREE FLOW		DIST. SYSTEM LANSDOWNE ST S STANDING	
CHEMISTRY (LABORATORY)						
IONCAL (DMNSLESS)		DET'N LIMIT = N/A		GUIDELINE = N/A		
1991 APR	15.540 NAF	.311 NAF	2.533 NAF			
1991 MAY	14.800 NAF	5.454 NAF	2.847	3.142		
1991 JUN	9.374	2.007	.000 NAF	.397		
1991 JUL	1.042	3.993	1.952	4.128		
1991 AUG	3.961	4.766				
1991 SEP	3.043 NAF	.709 NAF	1.057 NAF	.891 NAF		
1991 OCT	11.690	3.878	1.648	3.792		
1991 DEC	13.680	1.364	2.962	2.900		
1992 JAN	2.615	4.757	3.910	4.762		
1992 FEB	3.285	.408	.332	.130		
1992 MAR	2.209 NAF	.424 NAF	.348 NAF	.642 NAF		
1992 APR	4.984	4.598				
1992 MAY	3.695	.504	.550	.602		
1992 JUL	3.806 NAF	2.681 NAF	.471 NAF	1.372 NAF		
1992 SEP	3.203	2.659	3.258	3.424		
1992 NOV	2.456	4.504	4.869	4.643		
POTASSIUM (MG/L)						
		DET'N LIMIT = 0.01		GUIDELINE = 10 (F2)		
1991 APR	.600	.750	.550			
1991 MAY	.800	.790	.810	.830		
1991 JUN	.800	.850		1.050		
1991 JUL	.780	.770	.990	.810		
1991 AUG	.860	.980				
1991 SEP	1.000	.950	.970	.970		
1991 OCT	.800	.860	.880	.860		
1991 DEC	.780	.760	.750	.740		
1992 JAN	.790	.810	.810	.810		
1992 FEB	.810	.900	.940	.910		
1992 MAR	.840	.910	.910	.910		
1992 APR	.878	.972				
1992 MAY	.710	.770	.950	1.000		
1992 JUL	.790	.790	.800	.810		
1992 SEP	.896	.918	.924	.959		
1992 NOV	.764	.742	.796	.728		

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHAPLEAU WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM LANSDOWNE ST S FREE FLOW	DIST. SYSTEM LANSDOWNE ST S STANDING	GUIDELINE = N/A	
				DET'N LIMIT = N/A	GUIDELINE = N/A
CHEMISTRY (LABORATORY)					
LANGELIERS INDEX (OMNLESS)					
1991 APR	-1.562	-1.759	-1.718		
1991 MAY	-0.753	-1.149	-0.888		-0.768
1991 JUN	-0.859	-1.130			-0.958
1991 JUL	-0.973	-1.001	-0.984		-1.170
1991 AUG	-0.683	-0.806			
1991 SEP	-0.510	-0.700	-0.690		-0.682
1991 OCT	-0.952	-1.408	-1.573		-1.590
1991 DEC	-0.937	-1.200	-1.167		-1.168
1992 JAN	-0.838	-1.055	-0.995		-1.009
1992 FEB	-0.604	-0.468	-0.579		-0.737
1992 MAR	-0.633 NAF	-0.471 NAF	-0.514 NAF		-0.623 NAF
1992 APR	-1.415	-1.958			
1992 MAY	-1.197	-1.857	-1.335		-1.397
1992 JUL	-0.701 NAF	-0.888 NAF	-0.985 NAF		-1.070 NAF
1992 SEP	-0.523	-0.762	-0.796		-0.812
1992 NOV	-1.138	-1.995	-2.034		-2.040
MAGNESIUM (MG/L)					
DET'N LIMIT = 0.1					
1991 APR	2.000	2.000	1.900		2.000
1991 MAY	2.350	2.150	2.050		2.500
1991 JUN	2.500	2.400			2.250
1991 JUL	2.500	2.450	2.300		
1991 AUG	2.800	3.100			
1991 SEP	3.050	3.100	3.100		3.100
1991 OCT	2.750	2.700	3.050		3.100
1991 DEC	3.000	2.900	2.900		2.950
1992 JAN	2.650	2.600	2.600		2.650
1992 FEB	2.920	2.920	2.800		2.700
1992 MAR	3.060	3.040	2.900		2.900
1992 APR	2.250	2.390			
1992 MAY	2.140	2.130	2.920		3.090
1992 JUL	2.840	2.820	2.720		2.780
1992 SEP	3.210	3.210	3.190		3.260
1992 NOV	2.690	2.660	2.660		2.640
GUIDELINE = 30.0 (F2)					

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHAPLEAU WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM LANSOUNE ST S FREE FLOW	DIST. SYSTEM LANSOUNE ST S STANDING
CHEMISTRY (LABORATORY)			
SODIUM (MG/L)		DET'N LIMIT = 0.20	GUIDELINE = 200 (A4)
1991 APR	1.200	15.600	
1991 MAY	2.000	16.800	14.900
1991 JUN	1.600	14.400	10.600
1991 JUL	1.900	10.000	10.500
1991 AUG	2.100	12.200	12.200
1991 SEP	2.300	10.100	10.000
1991 OCT	1.600	11.300	4.600
1991 DEC	1.500	9.800	3.600
1992 JAN	1.600	9.200	8.800
1992 FEB	1.670	9.600	9.700
1992 MAR	1.750	13.900	14.800
1992 APR	1.260	13.100	14.300
1992 MAY	1.590	8.250	
1992 JUN	1.900	18.100	16.800
1992 JUL	1.970	12.200	12.800
1992 SEP	1.970	12.370	12.530
1992 NOV	1.610	9.220	8.280
AMMONIUM TOTAL (MG/L)			
		DET'N LIMIT = 0.002	GUIDELINE = 0.05 (F2)
1991 APR	.044	.344	
1991 MAY	.046	.374	.380
1991 JUN	.020	.274	.286
1991 JUL	.012	.310	.004 <T
1991 AUG	.014	.166	
1991 SEP	.80L	.340	.024
1991 OCT	.014	.676	.302
1991 DEC	.028	.552	.306
1992 JAN	.050	.444	.468
1992 FEB	.044	.438	.596
1992 MAR	.030	.336	.242
1992 APR	.028	.216	
1992 MAY	.014	.340	.176
1992 JUL	.020	.380	.018
1992 SEP	.006 <T	.334	.018
1992 NOV	.020	.294	.312

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHAPLEAU WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	CHEMISTRY (LABORATORY)				DIST. SYSTEM LANSODUNE ST S FREE FLOW	DIST. SYSTEM LANSODUNE ST S STANDING
		NITRITE (MG/L)		DET'N LIMIT = 0.001	GUIDELINE = 1.0 (A1)		
1991 APR	.004 <T	BOL	.009	.028			
1991 MAY	.004 <T	.009	.059	.059			
1991 JUN	.002 <T	.001 <T	.071	.191			
1991 JUL	.003 <T	.008					
1991 AUG	.003 <T	.001 <T	.075	.067			
1991 SEP	.001 <T	.003 <T	.067	.072			
1991 OCT	.005	.001 <T	.050	.098			
1991 DEC	.003 <T	.002 <T	.024	.024			
1992 JAN	.005	.002 <T	.003 <T	.029			
1992 FEB	.006	.005	.023	.043			
1992 MAR	.005	.004 <T	.017				
1992 APR	.006	.002 <T					
1992 MAY	.007	.001 <T	.007	.001 <T			
1992 JUL	.005	.004 <T	.048	.095			
1992 SEP	.003 <T	.001 <T	.077	.214			
1992 NOV	.006	.001 <T	.071	.010			

NITRATE (TOTAL) (MG/L)		DET'N LIMIT = 0.005				GUIDELINE = 10.0 (A1)	
1991 APR	.175	.195	.210	.065			
1991 MAY	.030	.040	.095	.090			
1991 JUN	.010 <T	.020 <T		.495			
1991 JUL	.010 <T	.030	.080				
1991 AUG	.015 <T	.035					
1991 SEP	.005 <T	.030	.165	.400			
1991 OCT	.060	.070	.175	.610			
1991 DEC	.110	.115	.215	.465			
1992 JAN	.120	.125	.155	.185			
1992 FEB	.145	.145	.180	.220			
1992 MAR	.185	.200	.190	.355			
1992 APR	.290	.310					
1992 MAY	.060	.065	.150	.630			
1992 JUL	.045	.025	.070	.455			
1992 SEP	.015 <T	.030	.160	.395			
1992 NOV	.085	.090	.165	.135			

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHAPLEAU WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM LANSDOVNE ST S FREE FLOW	DIST. SYSTEM LANSDOVNE ST S STANDING
CHEMISTRY (LABORATORY)			
PHOSPHORUS	FIL REACT (MG/L)	DET'N LIMIT = 0.0005	GUIDELINE = N/A
1991 APR	.003	.001 <T	.
1991 MAY	.000 <T	BOL	.
1991 JUN	.001 <T	BOL	.
1991 JUL	.001 <T	.000 <T	.
1991 AUG	.001 <T	BOL	.
1991 SEP	.002 <T	.000 <T	.
1991 OCT	.001 <T	BOL	.
1991 DEC	.000 <T	BOL	.
1992 JAN	.001 <T	.000 <T	.
1992 FEB	BOL	BOL	.
1992 MAR	BOL	BOL	.
1992 APR	BOL	BOL	.
1992 MAY	.001 <T	BOL	.
1992 JUL	.001 <T	BOL	.
1992 SEP	BOL	BOL	.
1992 NOV	.001 <T	BOL	.
PHOSPHORUS TOTAL (MG/L)		DET'N LIMIT = 0.002	GUIDELINE = 0.40 (F2)
1991 APR	.005 <T	BOL	.
1991 MAY	.006 <T	BOL	.
1991 JUN	.008 <T	.009 <T	.
1991 JUL	.010	.002 <T	.
1991 AUG	.011	BOL	.
1991 SEP	.010	.002 <T	.
1991 OCT	.011	BOL	.
1991 DEC	.009 <T	BOL	.
1992 JAN	.015	.008 <T	.
1992 FEB	.006 <T	.002 <T	.
1992 MAR	.010	.006 <T	.
1992 APR	.011	BOL	.
1992 MAY	.012	.003 <T	.
1992 JUL	.008 <T	BOL	.
1992 SEP	.010	.003 <T	.
1992 NOV	.007 <T	BOL	.

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHAPLEAU WTP

TREATMENT PLANT RAW		TREATMENT PLANT TREATED	CHEMISTRY (LABORATORY)		DIST. SYSTEM LANSOWNE ST S FREE FLOW		DIST. SYSTEM LANSOWNE ST S STANDING	
RESIDUE FILTRATE (MG/L)			DET'N LIMIT = N/A		GUIDELINE = 500 (A3)			
1991 APR	43,000 CRO	96,200 CRO	101,000 CRO					
1991 MAY	50,000 CRO	93,000 CRO	91,000 CRO					94,400 CRO
1991 JUN	57,800 CRO	95,600 CRO						99,600 CRO
1991 JUL	57,400 CRO	93,600 CRO	91,000 CRO					92,400 CRO
1991 AUG	64,000 CRO	100,000 CRO						
1991 SEP	71,200 CRO	103,000 CRO	102,000 CRO					103,000 CRO
1991 OCT	56,000 CRO	101,000 CRO	94,400 CRO					94,400 CRO
1991 DEC	57,000 CRO	93,600 CRO	93,000 CRO					93,000 CRO
1992 JAN	62,400 CRO	97,000 CRO	99,600 CRO					101,000 CRO
1992 FEB	63,800 CRO	109,000 CRO	105,000 CRO					107,000 CRO
1992 MAR	68,000 CRO	107,000 CRO	108,000 CRO					108,000 CRO
1992 APR	45,000 CRO	80,800 CRO						
1992 MAY	45,800 CRO	79,200 CRO	128,000 CRO					127,000 CRO
1992 JUL	63,200 CRO	104,000 CRO	105,000 CRO					106,000 CRO
1992 SEP	69,400 CRO	111,000 CRO	112,000 CRO					113,000 CRO
1992 NOV	58,200 CRO	95,000 CRO	94,400 CRO					95,600 CRO
SULPHATE (MG/L)		DET'N LIMIT = 0.20		GUIDELINE = 500 (A3)				
1991 APR	5,120	42,580	44,690					
1991 MAY	5,070	32,620	32,200					33,390
1991 JUN	4,060	34,680						36,010
1991 JUL	4,430	30,670	30,810					31,170
1991 AUG	4,190	30,110						
1991 SEP	4,660	29,740	29,480					29,310
1991 OCT	4,400	46,170	46,010					44,230
1991 DEC	5,370	33,930	29,820					32,190
1992 JAN	5,140	32,390	31,930					32,140
1992 FEB	5,080	31,100	31,140					32,120
1992 MAR	5,190	27,230	26,440					27,420
1992 APR	5,500	36,300						
1992 MAY	5,030	33,230	55,010					54,870
1992 JUL	5,130	40,450	37,990					39,200
1992 SEP	3,750	36,180	35,840					35,450
1992 NOV	4,650	42,960	42,890					42,560

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHAPLEAU WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	CHEMISTRY (LABORATORY)		DET'N LIMIT = 0.05		GUIDELINE = 1.0 (A1)	
		TURBIDITY (FTU)		FREE FLOW	STANDING		
1991 APR	2.000	1.090 RRV	2.500 RRV	1.240 RRV			
1991 MAY	1.760	.590	2.200 RRV	1.170			
1991 JUN	1.530 RRV	.500		.550			
1991 JUL	1.500	.150	.470				
1991 AUG	1.800	.430					
1991 SEP	2.800	.210	.520	.310			
1991 OCT	1.700	.410	1.980 RRV	1.540 RRV			
1991 DEC	.950	.910	.980	.710			
1992 JAN	1.620	.780	.890	.990			
1992 FEB	.760	.060 < T	.390	.510			
1992 MAR	.940	.080 < T	.220 < T	.290			
1992 APR	1.620	1.550 RRV	2.100 RRV	.900			
1992 MAY	2.900	1.290 RRV	.990	.850			
1992 JUL	1.270	.980	.930	.870			
1992 SEP	3.100	.620					
1992 NOV	2.100	1.470 RRV	4.300 RRV	2.800 RRV			

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHAPLEAU WTP

SILVER (UG/L)	TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM LANSDOWNE ST S FREE FLOW	DIST. SYSTEM LANSDOWNE ST S STANDING	METALS	DET'N LIMIT = 0.05	GUIDELINE = N/A
1991 APR	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1991 MAY	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1991 JUN	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1991 JUL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1991 AUG	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1991 SEP	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1991 OCT	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1991 DEC	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 JAN	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 FEB	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 MAR	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 APR	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 MAY	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 JUN	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 JUL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 SEP	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 NOV	BDL	BDL	BDL	BDL	BDL	BDL	BDL
ALUMINUM (UG/L)							
1991 APR	140.000	780.000	450.000	280.000	BDL	BDL	BDL
1991 MAY	84.000	270.000	220.000	240.000	BDL	BDL	BDL
1991 JUN	52.000	180.000	120.000	70.000	BDL	BDL	BDL
1991 JUL	33.000	36.000	23.000	25.000	BDL	BDL	BDL
1991 AUG	33.000	23.000	18.000	100.000	BDL	BDL	BDL
1991 SEP	31.000	20.000	130.000	140.000	BDL	BDL	BDL
1991 OCT	61.000	260.000	150.000	67.000	BDL	BDL	BDL
1991 DEC	65.000	140.000	71.000	40.000	BDL	BDL	BDL
1992 JAN	110.000	95.000	54.000	37.000	BDL	BDL	BDL
1992 FEB	55.000	66.000	110.000	300.000	BDL	BDL	BDL
1992 MAR	44.000	110.000	52.000	510.000	BDL	BDL	BDL
1992 APR	87.000	600.000	460.000	45.000	BDL	BDL	BDL
1992 MAY	160.000	460.000	530.000	95.000	BDL	BDL	BDL
1992 JUN	34.000	900.000 RRV	42.000	42.000	BDL	BDL	BDL
1992 SEP	36.000	42.000	220.000	95.000	BDL	BDL	BDL
1992 NOV	71.000	560.400 RRV	220.000	95.000	BDL	BDL	BDL

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHAPLEAU WTP

TREATMENT PLANT RAW		TREATMENT PLANT TREATED	DIST. SYSTEM LANDSDOWNE ST S FREE FLOW		DIST. SYSTEM LANDSDOWNE ST S STANDING	
METALS						
ARSENIC (UG/L)		DET'N LIMIT = 0.10		GUIDELINE = 25 (A1)		
1991 APR	.380 <T	.130 <T	.160 <T	BDL		
1991 MAY	BDL	BDL	BDL	.280 <T		
1991 JUN	.380 <T	.200 <T	.430 <T	.390 <T		
1991 JUL	.540 <T	.310 <T				
1991 AUG	.380 <T	.290 <T				
1991 SEP	.310 <T	.230 <T		.250 <T		
1991 OCT	.360 <T	.130 <T	.230 <T	.130 <T		
1991 DEC	.410 <T	.330 <T	.280 <T	.290 <T		
1992 JAN	.380 <T	.210 <T	.190 <T	.190 <T		
1992 FEB	.320 <T	.280 <T	.210 <T	.250 <T		
1992 MAR	.380 <T	.190 <T	.240 <T	BDL		
1992 APR	.280 <T	.240 <T	BDL	.120 <T		
1992 MAY	.180 <T	BDL	.350 <T	.370 <T		
1992 JUL	.360 <T	.300 <T		.710 <T		
1992 SEP	.890 <T	.640 <T	.970 <T	.230 <T		
1992 NOV	.380 <T	.280 <T	BDL			
BARIUM (UG/L)		DET'N LIMIT = 0.05		GUIDELINE = 1000 (A2)		
1991 APR	11.000	10.000	8.100			
1991 MAY	12.000	11.000	3.700	5.400		
1991 JUN	14.000	13.000		12.000		
1991 JUL	13.000	13.000	6.700	10.000		
1991 AUG	14.000	13.000				
1991 SEP	15.000	14.000	14.000	16.000		
1991 OCT	12.000	12.000	26.000	31.000		
1991 DEC	12.000	12.000	14.000	15.000		
1992 JAN	13.000	12.000	12.000	16.000		
1992 FEB	14.000	13.000	7.400	9.100		
1992 MAR	16.000	15.000	9.600	12.000		
1992 APR	9.700	10.000				
1992 MAY	12.000	11.000	16.000	24.000		
1992 JUL	11.000	13.000	9.600	13.000		
1992 SEP	14.000	14.000	12.000	14.000		
1992 NOV	12.000	11.000	14.000	17.000		

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHAPLEAU WTP

TREATMENT PLANT RAW		TREATMENT PLANT TREATED	DIST. SYSTEM LANDSOUND ST S FREE FLOW		DIST. SYSTEM LANDSOUND ST S STANDING		
BORON (UG/L)		METALS				GUIDELINE = 5000 (A1)	
		DET'N LIMIT = 2.00					
1991 APR	6,400 <T	5,200 <T	3,300 <T	BDL	BDL		
1991 MAY	BDL	BDL	BDL	BDL	BDL		
1991 JUN	3,000 <T	3,000 <T	6,900 <T	BDL	3,300 <T		
1991 JUL	7,300 <T	6,900 <T	6,900 <T	BDL	7,000 <T		
1991 AUG	7,200 <T	6,900 <T	6,900 <T	BDL	10,000 <T		
1991 SEP	9,500 <T	9,100 <T	6,600 <T	BDL	7,600 <T		
1991 OCT	7,000 <T	5,700 <T	6,200 <T	BDL	4,700 <T		
1991 DEC	7,100 <T	4,700 <T	4,300 <T	BDL	5,000 <T		
1992 JAN	4,500 <T	4,500 <T	4,400 <T	BDL	BDL		
1992 FEB	BDL	BDL	3,600 <T	BDL	4,100 <T		
1992 MAR	4,100 <T	3,500 <T	4,200 <T	BDL	3,400 <T		
1992 APR	4,900 <T	4,300 <T	6,200 <T	BDL	7,500 <T		
1992 MAY	3,800 <T	3,300 <T	6,500 <T	BDL	7,200 <T		
1992 JUL	23,000	14,000 <T	4,300 <T	BDL	5,200 <T		
1992 SEP	7,000 <T	6,600 <T	4,300 <T	BDL			
1992 NOV	4,400 <T	3,900 <T					
BERYLLIUM (UG/L)		DET'N LIMIT = 0.05				GUIDELINE = 6800 (D4)	
1991 APR	BDL	BDL	BDL	BDL	BDL		
1991 MAY	BDL	BDL	BDL	BDL	BDL		
1991 JUN	BDL	BDL	BDL	BDL	BDL		
1991 JUL	BDL	BDL	BDL	BDL	BDL		
1991 AUG	BDL	BDL	BDL	BDL	BDL		
1991 SEP	BDL	BDL	BDL	BDL	BDL		
1991 OCT	BDL	BDL	BDL	BDL	BDL		
1991 DEC	BDL	BDL	BDL	BDL	BDL		
1992 JAN	BDL	BDL	BDL	BDL	BDL		
1992 FEB	BDL	BDL	BDL	BDL	BDL		
1992 MAR	BDL	BDL	BDL	BDL	BDL		
1992 APR	BDL	BDL	BDL	BDL	BDL		
1992 MAY	BDL	BDL	BDL	BDL	BDL		
1992 JUL	BDL	BDL	BDL	BDL	BDL		
1992 SEP	BDL	BDL	BDL	BDL	BDL		
1992 NOV	BDL	BDL	BDL	BDL	BDL		

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHAPLEAU WTP

TREATMENT PLANT RAW		TREATMENT PLANT TREATED	DIST. SYSTEM FREE FLOW		DIST. SYSTEM STANDING	
METALS						
CADMIUM (UG/L)			DET'N LIMIT = 0.05		GUIDELINE	
1991 APR	BDL	BDL	BDL	BDL		BDL
1991 MAY	BDL	BDL	BDL	BDL		BDL
1991 JUN	BDL	BDL	BDL	BDL		BDL
1991 JUL	BDL	BDL	BDL	BDL		BDL
1991 AUG	BDL	BDL	BDL	BDL		BDL
1991 SEP	BDL	BDL	BDL	BDL		BDL
1991 OCT	BDL	BDL	BDL	BDL		BDL
1991 DEC	BDL	BDL	BDL	BDL		BDL
1992 JAN	BDL	BDL	BDL	BDL		BDL
1992 FEB	BDL	BDL	BDL	BDL		BDL
1992 MAR	BDL	BDL	BDL	BDL		BDL
1992 APR	BDL	BDL	BDL	BDL		BDL
1992 MAY	BDL	BDL	BDL	BDL		BDL
1992 JUL	BDL	BDL	BDL	BDL		BDL
1992 SEP	BDL	BDL	BDL	BDL		BDL
1992 NOV	BDL	BDL	BDL	BDL		BDL
COBALT (UG/L)			DET'N LIMIT = 0.02		GUIDELINE	
1991 APR	.160 <T	.130 <T	.100 <T	.220 <T		
1991 MAY	.200 <T	.240 <T	.180 <T	.100 <T		
1991 JUN	.090 <T	.110 <T	.500 <T	.500 <T		
1991 JUL	.490 <T	.480 <T		.120 <T		
1991 AUG	.080 <T	.090 <T		.160 <T		
1991 SEP	.120 <T	.100 <T	.080 <T	.120 <T		
1991 OCT	.110 <T	.090 <T	.160 <T	.160 <T		
1991 DEC	.130 <T	.110 <T	.130 <T	.110 <T		
1992 JAN	.140 <T	.110 <T	.120 <T	.120 <T		
1992 FEB	.190 <T	.150 <T	.130 <T	.180 <T		
1992 MAR	.170 <T	.150 <T	.140 <T	.160 <T		
1992 APR	.160 <T	.150 <T		.290 <T		
1992 MAY	.170 <T	.120 <T	.120 <T	.180 <T		
1992 JUL	.170 <T	.150 <T	.150 <T	.170 <T		
1992 SEP	.180 <T	.140 <T	.150 <T	.170 <T		
1992 NOV	.050 <T	.060 <T	.210 <T	.050 <T		

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHAPLEAU WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM LANSOONE ST S FREE FLOW	DIST. SYSTEM LANSOONE ST S STANDING	METALS		DET'N LIMIT = 0.50	GUIDELINE
				CHROMIUM (UG/L)			
1991 APR	1.400 <T	1.600 <T	.710 <T				
1991 MAY	.770 <T	.660 <T	.550 <T				.640 <T
1991 JUN	BDL	BDL					BDL
1991 JUL	1.500 <T	1.200 <T	1.300 <T				1.300 <T
1991 AUG	.850 <T	.630 <T					
1991 SEP	1.500 <T	1.100 <T	.510 <T				1.200 <T
1991 OCT	1.300 <T	.620 <T	BDL				.750 <T
1991 DEC	1.600 <T	.530 <T	BDL				.520 <T
1992 JAN	BDL	BDL	BDL				BDL
1992 FEB	BDL	BDL	BDL				BDL
1992 MAR	BDL	BDL	BDL				BDL
1992 APR	BDL	BDL					
1992 MAY	.930 <T	BDL	.790 <T				
1992 JUL	2.000 <T	1.200 <T	BDL				BDL
1992 SEP	2.100 <T	1.600 <T	1.600 <T				1.700 <T
1992 NOV	.520 <T	.580 <T	.780 <T				BDL
COPPER (UG/L)		DET'N LIMIT = 0.50		GUIDELINE			
1991 APR	.960 <T	BDL	14.000				
1991 MAY	.930 <T	1.200 <T	5.300				65.000
1991 JUN	.910 <T	BDL					70.000
1991 JUL	.710 <T	.620 <T	6.500				56.000
1991 AUG	.650 <T	BDL					
1991 SEP	.690 <T	BDL	12.000				74.000
1991 OCT	.670 <T	.730 <T	42.000				320.000
1991 DEC	.650 <T	BDL	22.000				120.000
1992 JAN	.790 <T	BDL	17.000				230.000
1992 FEB	.770 <T	BDL	8.500				120.000
1992 MAR	.790 <T	.510 <T	9.200				120.000
1992 APR	1.100 <T	BDL					
1992 MAY	1.100 <T	.800 <T	24.000				220.000
1992 JUL	3.200 <T	.640 <T	13.000				120.000
1992 SEP	.610 <T	.510 <T	16.000				130.000
1992 NOV	.750 <T	BDL	110.000				390.000

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHAPLEAU WTP

TREATMENT PLANT RAW		TREATMENT PLANT TREATED	TREATMENT PLANT	DIST. SYSTEM		DIST. SYSTEM	
				LANSDOWNE ST S FREE FLOW	LANSDOWNE ST S STANDING		
METALS							
IRON (UG/L)		DET'N LIMIT = 6.00			GUIDELINE		
1991 APR	180.000	28.000 <T	660.000				
1991 MAY	130.000	29.000 <T	530.000		450.000		
1991 JUN	190.000	29.000 <T			200.000		
1991 JUL	170.000	25.000 <T	200.000		140.000		
1991 AUG	180.000	14.000 <T					
1991 SEP	190.000	11.000 <T	160.000		150.000		
1991 OCT	220.000	37.000 <T	660.000		450.000		
1991 DEC	200.000	24.000 <T	700.000		480.000		
1992 JAN	210.000	18.000 <T	440.000		220.000		
1992 FEB	220.000	11.000 <T	320.000		300.000		
1992 MAR	200.000	15.000 <T	210.000		240.000		
1992 APR	160.000	9.900 <T					
1992 MAY	200.000	20.000 <T	440.000		400.000		
1992 JUL	110.000	31.000 <T	460.000		330.000		
1992 SEP	220.000	15.000 <T	250.000		220.000		
1992 NOV	200.000	82.000	890.000 RRV		360.000		
MERCURY (UG/L)		DET'N LIMIT = 0.02			GUIDELINE		
1991 APR	BOL						
1991 MAY	BOL	BOL					
1991 JUN	BOL	BOL					
1991 JUL	BOL	BOL					
1991 AUG	BOL	BOL					
1991 SEP	BOL	BOL					
1991 OCT	BOL	BOL					
1991 DEC	BOL	BOL					
1992 JAN	BOL	BOL					
1992 FEB	BOL	BOL					
1992 MAR	BOL	BOL					
1992 APR	BOL	BOL					
1992 MAY	BOL	0.040 <T					
1992 JUL	BOL	BOL					
1992 SEP	BOL	BOL					
1992 NOV	BOL	BOL					

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHAPLEAU WTP

TREATMENT PLANT RAW		TREATMENT PLANT TREATED	DIST. SYSTEM LANSOUMNE ST S FREE FLOW		DIST. SYSTEM LANSOUMNE ST S STANDING	
METALS						
MANGANESE (UG/L)			DET'N LIMIT = 0.05		GUIDELINE = 50.0 (A3)	
1991 APR	29.000	22.000	27.000	9.300		
1991 MAY	23.000	9.000	11.000			
1991 JUN	32.000	10.000		12.000		
1991 JUL	47.000	30.000	16.000	21.000		
1991 AUG	29.000	16.000				
1991 SEP	25.000	12.000				
1991 OCT	26.000	23.000	21.000	27.000		
1991 DEC	22.000	20.000	81.000	96.000		
1992 JAN	26.000	20.000	34.000	32.000		
1992 FEB	30.000	20.000	28.000	28.000		
1992 MAR	30.000	24.000	20.000	22.000		
1992 APR	30.000	22.000	18.000	7.500		
1992 MAY	31.000	29.000				
1992 JUN	34.000	7.100	39.000	53.000		
1992 JUL	8.400	13.000	16.000	17.000		
1992 SEP	28.000	11.000	17.000	18.000		
1992 NOV	22.000	15.000	40.000	41.000		
MOLYBDENUM (UG/L)			DET'N LIMIT = 0.05		GUIDELINE = N/A	
1991 APR	.060 <T	.060 <T	.080 <T			
1991 MAY	BDL	BDL	BDL			
1991 JUN	.080 <T	BDL				
1991 JUL	BDL	BDL	BDL			
1991 AUG	.080 <T	BDL				
1991 SEP	.060 <T	.060 <T	.080 <T			
1991 OCT	BDL	BDL	BDL			
1991 DEC	BDL	BDL	BDL			
1992 JAN	.080 <T	BDL	BDL			
1992 FEB	.060 <T	BDL	.080 <T			
1992 MAR	BDL	BDL	.070 <T			
1992 APR	BDL	BDL				
1992 MAY	BDL	.080 <T				
1992 JUL	.410 <T	BDL				
1992 SEP	BDL	BDL	BDL			
1992 NOV	BDL	BDL	BDL			

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHAPLEAU WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM LANSDOUNE ST S FREE FLOW	DIST. SYSTEM LANSDOUNE ST S STANDING
METALS			
NICKEL (UG/L)		DET'N LIMIT = 0.20	GUIDELINE = 350 (03)
1991 APR	.460 <T	BDL	2.000 <T
1991 MAY	BDL	BDL	4.800
1991 JUN	BDL	BDL	4.500
1991 JUL	1.500 <T	1.100 <T	
1991 AUG	.470 <T	.350 <T	
1991 SEP	BDL	.690 <T	5.500
1991 OCT	BDL	.230 <T	5.100
1991 DEC	BDL	BDL	3.500
1992 JAN	BDL	.240 <T	4.700
1992 FEB	.940 <T	.970 <T	3.900
1992 MAR	.250 <T	.340 <T	3.700
1992 APR	.420 <T	.360 <T	
1992 MAY	.390 <T	.580 <T	5.600
1992 JUL	.380 <T	.460 <T	1.200 <T
1992 SEP	2.900	2.800	5.700
1992 NOV	BDL	1.100 <T	18.000
			5.100
LEAD (UG/L)			
		DET'N LIMIT = 0.05	GUIDELINE = 10 (A1)
1991 APR	.210 <T	.080 <T	
1991 MAY	.190 <T	.060 <T	1.600
1991 JUN	.180 <T	BDL	2.900
1991 JUL	.130 <T	BDL	1.900
1991 AUG	.190 <T	BDL	
1991 SEP	.200 <T	BDL	2.800
1991 OCT	.070 <T	BDL	5.300
1991 DEC	.090 <T	.070 <T	2.900
1992 JAN	.090 <T	.240 <T	3.200
1992 FEB	BDL	BDL	2.600
1992 MAR	.230 <T	.090 <T	3.100
1992 APR	.090 <T	BDL	
1992 MAY	.240 <T	BDL	4.100
1992 JUL	BDL	.640	2.200
1992 SEP	.150 <T	.960	10.000
1992 NOV	.120 <T	2.200	4.500

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHAPLEAU WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM LANSDOUNE ST S FREE FLOW	DIST. SYSTEM LANSDOUNE ST S STANDING
METALS			
ANTIMONY (UG/L)	DET'N LIMIT = 0.05		
			GUIDELINE = 146 (D4)
1991 APR	.440 <T	.370 <T	.490 <T
1991 MAY	.380 <T	.300 <T	.410 <T
1991 JUN	.640	.550	.720
1991 JUL	.460 <T	.660	.590
1991 AUG	.420 <T	.390 <T	.540
1991 SEP	.460 <T	.420 <T	.540
1991 OCT	.450 <T	.360 <T	.430 <T
1991 DEC	.350 <T	.330 <T	.360 <T
1992 JAN	.480 <T	.460 <T	.340
1992 FEB	.640	.640	.640
1992 MAR	.610	.480 <T	.510
1992 APR	.390 <T	.310 <T	.470 <T
1992 MAY	.380 <T	.320 <T	.390 <T
1992 JUL	.560	.320 <T	.340 <T
1992 SEP	.310 <T	.350 <T	.340 <T
1992 NOV	.550	.590	.520
SELENIUM (UG/L)			
		DET'N LIMIT = 1.00	GUIDELINE = 10 (A1)
1991 APR	BDL	BDL	.5
1991 MAY	BDL	BDL	BDL
1991 JUN	BDL	BDL	BDL
1991 JUL	BDL	BDL	BDL
1991 AUG	BDL	BDL	.5
1991 SEP	BDL	BDL	BDL
1991 OCT	BDL	BDL	BDL
1991 DEC	BDL	BDL	BDL
1992 JAN	BDL	BDL	BDL
1992 FEB	BDL	BDL	BDL
1992 MAR	BDL	BDL	1,200 <T
1992 APR	BDL	BDL	.5
1992 MAY	BDL	BDL	BDL
1992 JUL	BDL	BDL	BDL
1992 SEP	BDL	BDL	BDL
1992 NOV	BDL	BDL	BDL

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHAPLEAU WTP

TREATMENT PLANT RAW		TREATMENT PLANT TREATED	DIST. SYSTEM FREE FLOW	DIST. SYSTEM LANDSOMME ST S STANDING
METALS				
STRONTIUM (UG/L)			DET'N LIMIT = 0.10	
1991 APR			19,000	17,000
1991 MAY			21,000	20,000
1991 JUN			28,000	32,000
1991 JUL			27,000	26,000
1991 AUG			28,000	
1991 SEP			32,000	
1991 OCT			24,000	31,000
1991 DEC			25,000	32,000
1992 JAN			26,000	27,000
1992 FEB			27,000	25,000
1992 MAR			31,000	23,000
1992 APR			19,000	28,000
1992 MAY			21,000	33,000
1992 JUL			26,000	33,000
1992 SEP			32,000	35,000
1992 NOV			25,000	26,000
TITANIUM (UG/L)			DET'N LIMIT = 0.50	
1991 APR			11,000	6,400
1991 MAY			17,000	12,000
1991 JUN			5,900	5,200
1991 JUL			15,000	13,000
1991 AUG			3,300 <T	11,000
1991 SEP			2,500 <T	
1991 OCT			5,400	1,300 <T
1991 DEC			4,300 <T	4,300 <T
1992 JAN			3,100 <T	3,500 <T
1992 FEB			4,800 <T	2,400 <T
1992 MAR			6,700	3,400 <T
1992 APR			5,300	6,000
1992 MAY			6,000	6,000
1992 JUL			4,800 <T	5,100
1992 SEP			3,500 <T	4,400 <T
1992 NOV			3,500 <T	2,200 <T
THALLIUM (UG/L)			DET'N LIMIT = 0.05	
1992 NOV			3,500 <T	5,800
58 SAMPLES			BOL	BOL
			BOL	BOL

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHAPLEAU WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM LANSOUMNE ST S FREE FLOW	DIST. SYSTEM LANSOUMNE ST S STANDING
METALS			
URANIUM (UG/L)		DET'N LIMIT = 0.05	
1991 APR	BDL	.060 <T	.060 <T
1991 MAY	BDL	BDL	BDL
1991 JUN	BDL	BDL	BDL
1991 JUL	BDL	BDL	BDL
1991 AUG	BDL	BDL	BDL
1991 SEP	BDL	BDL	BDL
1991 OCT	BDL	BDL	BDL
1991 DEC	BDL	BDL	BDL
1992 JAN	BDL	BDL	BDL
1992 FEB	BDL	BDL	BDL
1992 MAR	BDL	BDL	BDL
1992 APR	BDL	BDL	BDL
1992 MAY	BDL	BDL	BDL
1992 JUL	BDL	BDL	BDL
1992 SEP	BDL	BDL	BDL
1992 NOV	BDL	BDL	BDL
VANADIUM (UG/L)		DET'N LIMIT = 0.05	
1991 APR	.400 <T	.720	.450 <T
1991 MAY	.480 <T	1.400	.840
1991 JUN	.430 <T	1.200	.700
1991 JUL	BDL	.340 <T	.220 <T
1991 AUG	.330 <T	.620	.240 <T
1991 SEP	.350 <T	.540	.190 <T
1991 OCT	.300 <T	.100 <T	.120 <T
1991 DEC	.150 <T	BDL	BDL
1992 JAN	.280 <T	.110 <T	.080 <T
1992 FEB	.220 <T	BDL	BDL
1992 MAR	.220 <T	BDL	BDL
1992 APR	.200 <T	BDL	BDL
1992 MAY	.420 <T	.070 <T	.170 <T
1992 JUL	.170 <T	BDL	.110 <T
1992 SEP	.280 <T	BDL	BDL
1992 NOV	.120 <T	BDL	BDL

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHAPLEAU WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM LANDSOWNE ST FREE FLOW	DIST. SYSTEM LANDSOWNE ST S STANDING	METALS	ZINC (UG/L)	DET'N LIMIT = 0.20	GUIDELINE = 5000 (A3)
1991 APR	8,500	7,400	6,500				
1991 MAY	5,200	7,900	4,600				
1991 JUN	8,300	7,600					24,000
1991 JUL	5,500	6,800	5,800				34,000
1991 AUG	3,500	4,100					32,000
1991 SEP	2,800	3,600	7,800				59,000
1991 OCT	1,800 <T	5,000	16,000				110,000
1991 DEC	2,800	4,900	8,100				53,000
1992 JAN	4,800	4,500	11,000				67,000
1992 FEB	12,000	5,100	8,900				45,000
1992 MAR	5,200	3,800	7,900				49,000
1992 APR	5,400	7,700					
1992 MAY	3,600	6,700	14,000				85,000
1992 JUL	2,400	5,000	9,800				35,000
1992 SEP	3,600	7,200	12,000				110,000
1992 NOV	6,300	11,000	27,000				68,000

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHAPLEAU WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM LANSDOUNE ST S FREE FLOW	DIST. SYSTEM LANSDOUNE ST S STANDING	
CHLOROBROMATICS				
HEXACHLOROBUTADIENE (NG/L)		DET'N LIMIT = 1,000	GUIDELINE = 450 (D4)	
32 SAMPLES	BDL	BDL		
123-TRICHLOROBENZENE (NG/L)		DET'N LIMIT = 5,000	GUIDELINE = N/A	
30 SAMPLES	BDL	BDL		
1234-TETChlorobenzene (NG/L)		DET'N LIMIT = 1,000	GUIDELINE = N/A	
30 SAMPLES	BDL	BDL		
1235-TETChlorobenzene (NG/L)		DET'N LIMIT = 1,000	GUIDELINE = N/A	
32 SAMPLES	BDL	BDL		
124-TRICHLOROBENZENE (NG/L)		DET'N LIMIT = 5,000	GUIDELINE = 10000 (I)	
27 SAMPLES	BDL	BDL		
1245-TETChlorobenzene (NG/L)		DET'N LIMIT = 1,000	GUIDELINE = 38000 (D4)	
32 SAMPLES	BDL	BDL		
135-TRICHLOROBENZENE (NG/L)		DET'N LIMIT = 5,000	GUIDELINE = N/A	
32 SAMPLES	BDL	BDL		
HEXACHLOROBENZENE (NG/L)		DET'N LIMIT = 1,000	GUIDELINE = 10 (C1)	
32 SAMPLES	BDL	BDL		

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHAPLEAU WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM LANSOWNE ST S FREE FLOW	DIST. SYSTEM LANSOWNE ST S STANDING	
CHLORODROMATICS				
HEXACHLORODETHANE (NG/L)		DET'N LIMIT = 1,000	GUIDELINE = 1900 (D4)	
1991 APR	BDL	BDL	2,000 <T	-
1991 MAY	BDL	BDL	7,000 <T	-
1991 JUN	IAW	IAW	IAW	-
1991 JUL	IAW	IAW	IAW	-
1991 AUG	IAW	IAW	IAW	-
1991 SEP	IAW	IAW	IAW	-
1991 OCT	BDL	BDL	1,000 <T	-
1991 DEC	BDL	BDL	1,000 <T	-
1992 FEB	BDL	BDL	BDL	-
1992 MAR	BDL	6,000 <T	4,000 <T	-
1992 APR	3,000 <T	BDL	-	-
1992 MAY	BDL	BDL	BDL	-
1992 JUL	BDL	1,000 <T	1,000 <T	-
1992 SEP	BDL	BDL	BDL	-
1992 NOV	BDL	2,000 <T	BDL	-
OCTACHLOROSTYRENE (NG/L)		DET'N LIMIT = 1,000	GUIDELINE = N/A	
32 SAMPLES	BDL	BDL	BDL	-
PENTACHLOROBENZENE (NG/L)		DET'N LIMIT = 1,000	GUIDELINE = 74000 (D4)	
32 SAMPLES	BDL	BDL	BDL	-
236-TRICHLOROTOLUENE (NG/L)		DET'N LIMIT = 5,000	GUIDELINE = N/A	
32 SAMPLES	BDL	BDL	BDL	-
245-TRICHLOROTOLUENE (NG/L)		DET'N LIMIT = 5,000	GUIDELINE = N/A	
32 SAMPLES	BDL	BDL	BDL	-
26A-TRICHLOROTOLUENE (NG/L)		DET'N LIMIT = 5,000	GUIDELINE = N/A	
32 SAMPLES	BDL	BDL	BDL	-

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHAPLEAU WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM LANSDOWNE ST S FREE FLOW	DIST. SYSTEM LANSDOWNE ST S STANDING
CHLOROPHENOLS			
234-TRICHLOROPHENOL (NG/L)			
22 SAMPLES	BDL	DET'N LIMIT = 100.0	GUIDELINE = N/A
2345-TETRACHLOROPHENOL (NG/L)			
22 SAMPLES	BDL	DET'N LIMIT = 20.0	GUIDELINE = N/A
2356-TETRACHLOROPHENOL (NG/L)			
22 SAMPLES	BDL	DET'N LIMIT = 10.0	GUIDELINE = N/A
245-TRICHLOROPHENOL (NG/L)			
22 SAMPLES	BDL	DET'N LIMIT = 100.0	GUIDELINE = 2600000 (D4)
246-TRICHLOROPHENOL (NG/L)			
22 SAMPLES	BDL	DET'N LIMIT = 20.0	GUIDELINE = 5000 (A1)
PENTACHLOROPHENOL (NG/L)			
1991 JUN	BDL	DET'N LIMIT = 10.00	GUIDELINE = 60000 (A1)
1991 JUL	1UN		
1991 AUG	BDL		
1991 SEP	1UN		
1991 DEC	20,000 <T		
1992 FEB	BDL		
1992 MAR	BDL		
1992 APR	BDL		
1992 MAY	BDL		
1992 JUL	BDL		
1992 SEP	BDL		

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHAPLEAU WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM LANSDOVNE ST S FREE FLOW STANDING	OIST. SYSTEM LANSDOVNE ST S
PESTICIDES AND PCB			
ALORIN (NG/L)		DET'N LIMIT = 1.000	GUIDELINE = 700 (A1)
32 SAMPLES	BDL	BDL	
ALPHA BHC (NG/L)		DET'N LIMIT = 1.000	GUIDELINE = 700 (G)
32 SAMPLES	BDL	BDL	
BETA BHC (NG/L)		DET'N LIMIT = 1.000	GUIDELINE = 300 (G)
32 SAMPLES	BDL	BDL	
LINDANE (GAMMA BHC) (NG/L)		DET'N LIMIT = 1.000	GUIDELINE = 4000 (A1)
32 SAMPLES	BDL	BDL	
ALPHA CHLORDANE (NG/L)		DET'N LIMIT = 2.000	GUIDELINE = 7000 (A1)
32 SAMPLES	BDL	BDL	
GAMMA CHLORDANE (NG/L)		DET'N LIMIT = 2.000	GUIDELINE = 7000 (A1)
32 SAMPLES	BDL	BDL	
DIELDRIN (NG/L)		DET'N LIMIT = 2.000	GUIDELINE = 700 (A1)
32 SAMPLES	BDL	BDL	
METHOXYCHLOR (NG/L)		DET'N LIMIT = 5.0	GUIDELINE = 900000 (A1)
32 SAMPLES	BDL	BDL	
ENDOSULFAN I (NG/L)		DET'N LIMIT = 2.000	GUIDELINE = 74000 (D4)
32 SAMPLES	BDL	BDL	
ENDOSULFAN II (NG/L)		DET'N LIMIT = 5.000	GUIDELINE = 74000 (D4)
32 SAMPLES	BDL	BDL	
ENDRIN (NG/L)		DET'N LIMIT = 5.000	GUIDELINE = 1600 (D3)
32 SAMPLES	BDL	BDL	
ENDOSULFAN SULPHATE (NG/L)		DET'N LIMIT = 5.000	GUIDELINE = N/A
32 SAMPLES	BDL	BDL	

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHAPLEAU WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM LANSOWNE ST S FREE FLOW	DIST. SYSTEM LANSOWNE ST S STANDING
PESTICIDES AND PCB			
HEPTACHLOR EPOXIDE (NG/L)		DET'N LIMIT = 1,000	GUIDELINE = 3000 (A1)
18 SAMPLES	BDL	BDL	
HEPTACHLOR (NG/L)		DET'N LIMIT = 1,000	GUIDELINE = 3000 (A1)
32 SAMPLES	BDL	BDL	
MIREX (NG/L)		DET'N LIMIT = 5,000	GUIDELINE = N/A
32 SAMPLES	BDL	BDL	
OXYCHLORDANE (NG/L)		DET'N LIMIT = 2,000	GUIDELINE = N/A
32 SAMPLES	BDL	BDL	
O,P-DDT (NG/L)		DET'N LIMIT = 5,000	GUIDELINE = 30000 (A1)
32 SAMPLES	BDL	BDL	
PCB (NG/L)		DET'N LIMIT = 20.00	GUIDELINE = 3000 (A2)
30 SAMPLES	BDL	BDL	
P,P-DDD (NG/L)		DET'N LIMIT = 5,000	GUIDELINE = 30000 (A1)
32 SAMPLES	BDL	BDL	
P,P-DDE (NG/L)		DET'N LIMIT = 1,000	GUIDELINE = 30000 (A1)
32 SAMPLES	BDL	BDL	
P,P-DDT (NG/L)		DET'N LIMIT = 5,000	GUIDELINE = 30000 (A1)
32 SAMPLES	BDL	BDL	
TOXAPHENE (NG/L)		DET'N LIMIT = 500.0	GUIDELINE = 5000 (A1)
32 SAMPLES	BDL	BDL	
AMETRINE (NG/L)		DET'N LIMIT = 50.0	GUIDELINE = 300000 (D3)
22 SAMPLES	BDL		
ATRAZINE (NG/L)		DET'N LIMIT = 50.0	GUIDELINE = 60000 (A2)
22 SAMPLES	BDL		

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHAPLEAU WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM LANSDOUNE ST S FREE FLOW	DIST. SYSTEM LANSDOUNE ST S STANDING	
PESTICIDES AND PCB				
ATRATONE (NG/L)		DET*N LIMIT = 50.0	GUIDELINE = N/A	
20 SAMPLES	BDL			
CYANAZINE (BLADEX) (NG/L)		DET*N LIMIT = 100.0	GUIDELINE = 10000 (A2)	
22 SAMPLES	BDL			
DESETHYL ATRAZINE (NG/L)		DET*N LIMIT = 200.0	GUIDELINE = 60000 (A2)	
22 SAMPLES	BDL			
DESETHYL SIMAZINE (NG/L)		DET*N LIMIT = 200.0	GUIDELINE = 10000 (A2)	
20 SAMPLES	BDL			
PROMETONE (NG/L)		DET*N LIMIT = 50.000	GUIDELINE = 52500 (D3)	
22 SAMPLES	BDL			
PROPACINE (NG/L)		DET*N LIMIT = 50.000	GUIDELINE = 700000 (D3)	
22 SAMPLES	BDL			
PROMETRYNE (NG/L)		DET*N LIMIT = 50.000	GUIDELINE = 1000 (A2)	
22 SAMPLES	BDL			
METRIBUZIN (SENCOR) (NG/L)		DET*N LIMIT = 100.0	GUIDELINE = 80000 (A1)	
22 SAMPLES	BDL			
SIMAZINE (NG/L)		DET*N LIMIT = 50.00	GUIDELINE = 10000 (A2)	
22 SAMPLES	BDL			
ALACHLOR (LASSO) (NG/L)		DET*N LIMIT = 500.0	GUIDELINE = 5000 (A2)	
22 SAMPLES	BDL			
METOLACHLOR (NG/L)		DET*N LIMIT = 500.0	GUIDELINE = 50000 (A2)	
22 SAMPLES	BDL			

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHAPLEAU WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM FREE FLOW	DIST. SYSTEM STANDING	LANSDOWNE ST S	LANSDOWNE ST S

PESTICIDES AND PCB					
HEXACHLOROCYCLOPENTADIEN (NG/L)		DET'N LIMIT = 5.00		GUIDELINE = 206000 (D4)	
1991 APR	BDL	51.000	BDL	.	.
1991 MAY	BDL	23.000 <T	10.000 <T	.	.
1991 JUN	IAW	IAW	IAW	.	.
1991 JUL	IAW	IAW	IAW	.	.
1991 AUG	IAW	IAW	.	.	.
1991 SEP	IAW	IAW	IAW	.	.
1991 OCT	IOU	IOU	IOU	.	.
1991 DEC	BDL	10.000 <T	BDL	.	.
1992 FEB	BDL	BDL	BDL	.	.
1992 MAR	BDL	IOU	BDL	.	.
1992 APR	IOU	IOU	.	.	.
1992 MAY	IOU	IOU	BDL	.	.
1992 JUL	IOU	IOU	IOU	.	.
1992 SEP	IOU	IOU	IOU	.	.
1992 NOV	IOU	IOU	IOU	.	.

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHAPLEAU WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM LANSDOWNE ST S		DIST. SYSTEM LANSDOWNE ST S STANDING	GUIDELINE
		FREE FLOW			
PHENOLICS					
PHENOLICS (UG/L)		DET'N LIMIT =		0.2	
1991 APR	.400 <T	.800 <T	-	-	-
1991 MAY	.400 <T	1.000	-	-	-
1991 JUN	.400 <T	.600 <T	-	-	-
1991 JUL	.400 <T	.600 <T	-	-	-
1991 AUG	BDL	.600 <T	-	-	-
1991 SEP	.600 <T	1.800	-	-	-
1991 OCT	1.200	.800 <T	-	-	-
1991 DEC	.600 <T	1.000 <T	-	-	-
1992 JAN	.200 <T	.800 <T	-	-	-
1992 FEB	.400 <T	.400 <T	-	-	-
1992 MAR	BDL	1.200	-	-	-
1992 APR	.400 <T	1.400	-	-	-
1992 MAY	.400 <T	.400 <T	-	-	-
1992 JUL	BDL	1.000 <T	-	-	-
1992 SEP	BDL	.600 <T	-	-	-
1992 NOV	.400 <T	1.000 <T	-	-	-

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHAPLEAU WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM LANSDOWNE ST S FREE FLOW	DIST. SYSTEM LANSDOWNE ST S STANDING	
POLYAROMATIC HYDROCARBONS				
PHENANTHRENE (NG/L)		DET'N LIMIT = 10.0	GUIDELINE = N/A	
12 SAMPLES	BDL	BDL		
ANTHRACENE (NG/L)		DET'N LIMIT = 1.0	GUIDELINE = N/A	
12 SAMPLES	BDL	BDL		
FLUORANTHENE (NG/L)		DET'N LIMIT = 20.0	GUIDELINE = 42000 (D4)	
12 SAMPLES	BDL	BDL		
PYRENE (NG/L)		DET'N LIMIT = 20.0	GUIDELINE = N/A	
12 SAMPLES	BDL	BDL		
BENZO(A)ANTHRACENE (NG/L)		DET'N LIMIT = 20.0	GUIDELINE = N/A	
12 SAMPLES	BDL	BDL		
CHRYSENE (NG/L)		DET'N LIMIT = 50.0	GUIDELINE = N/A	
12 SAMPLES	BDL	BDL		
DIMETH. BENZ(A)ANTHR (NG/L)		DET'N LIMIT = 5.0	GUIDELINE = N/A	
12 SAMPLES	BDL	BDL		
BENZO(E) PYRENE (NG/L)		DET'N LIMIT = 50.0	GUIDELINE = N/A	
12 SAMPLES	BDL	BDL		
BENZO(B) FLUORANTHEN (NG/L)		DET'N LIMIT = 10.0	GUIDELINE = N/A	
12 SAMPLES	BDL	BDL		
PERYLENE (NG/L)		DET'N LIMIT = 10.0	GUIDELINE = N/A	
12 SAMPLES	BDL	BDL		
BENZO(K) FLUORANTHEN (NG/L)		DET'N LIMIT = 1.0	GUIDELINE = N/A	
12 SAMPLES	BDL	BDL		
BENZO(A) PYRENE (NG/L)		DET'N LIMIT = 5.0	GUIDELINE = 10 (A1)	
12 SAMPLES	BDL	BDL		

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHAPLEAU WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM LANDSOWNE ST S FREE FLOW	DIST. SYSTEM LANDSOWNE ST S STANDING	
POLYAROMATIC HYDROCARBONS				
BENZO(G,H,I) PERYLEN (NG/L)		DET'N LIMIT = 20.0		GUIDELINE = N/A
12 SAMPLES	BDL	BDL		

DIBENZO(A,H) ANTHRAC (NG/L)		DET'N LIMIT = 10.0		GUIDELINE = N/A
12 SAMPLES	BDL	BDL		

INDENO(1,2,3-C,D) PY (NG/L)		DET'N LIMIT = 20.0		GUIDELINE = N/A
12 SAMPLES	BDL	BDL		

BENZO(B) CHRYSENE (NG/L)		DET'N LIMIT = 2.0		GUIDELINE = N/A
12 SAMPLES	BDL	BDL		

CORONENE (NG/L)		DET'N LIMIT = 10.0		GUIDELINE = N/A
12 SAMPLES	BDL	BDL		

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHAPLEAU WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM LANSDOWNE ST S FREE FLOW	DIST. SYSTEM LANSDOWNE ST S STANDING	
SPECIFIC PESTICIDES				
2,4,5-T (NG/L)		DET'N LIMIT = 50.0	GUIDELINE = 280000 (A1)	
22 SAMPLES	BDL			
2,4-D (NG/L)		DET'N LIMIT = 100.0	GUIDELINE = 100000 (A1)	
22 SAMPLES	BDL			
2,4-DB (NG/L)		DET'N LIMIT = 200.0	GUIDELINE = N/A	
22 SAMPLES	BDL			
2,4 D PROTONIC ACID (NG/L)		DET'N LIMIT = 100.0	GUIDELINE = N/A	
22 SAMPLES	BDL			
DICAMBA (NG/L)		DET'N LIMIT = 50.0	GUIDELINE = 120000 (A1)	
22 SAMPLES	BDL			
2,4,5-TP (SILVEX) (NG/L)		DET'N LIMIT = 20.00	GUIDELINE = 10000 (A1)	
22 SAMPLES	BDL			
CARBOFURAN (NG/L)		DET'N LIMIT = 2000.0	GUIDELINE = 90000 (A1)	
2 SAMPLES	BDL			
CHLOROPHAPHAM (CIPC) (NG/L)		DET'N LIMIT = 2000.0	GUIDELINE = 350000 (G)	
2 SAMPLES	BDL			
DIALATE (NG/L)		DET'N LIMIT = 2000.0	GUIDELINE = N/A	
2 SAMPLES	BDL			
EPTAM (NG/L)		DET'N LIMIT = 2000.0	GUIDELINE = N/A	
2 SAMPLES	BDL			
IPC (NG/L)		DET'N LIMIT = 2000.0	GUIDELINE = N/A	
2 SAMPLES	BDL			
PROPOXUR (NG/L)		DET'N LIMIT = 2000.0	GUIDELINE = 140000 (D3)	
2 SAMPLES	BDL			

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHAPLEAU WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM LANSDOWNE ST S FREE FLOW	DIST. SYSTEM LANSDOWNE ST S STANDING
SPECIFIC PESTICIDES			
CARBARYL (NG/L)		DET'N LIMIT = 200.0	GUIDELINE = 90000 (A1)
2 SAMPLES	BDL		
BUTYLATE (NG/L)		DET'N LIMIT = 2000.0	GUIDELINE = 245000 (D3)
2 SAMPLES	BDL		

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHAPLEAU WTP

TREATMENT PLANT RAW		TREATMENT PLANT TREATED	DIST. SYSTEM LANSDOWNE ST S FREE FLOW	DIST. SYSTEM LANSDOWNE ST S STANDING
VOLATILES				
BENZENE (UG/L)		DET'N LIMIT = 0.05		
GUIDELINE = 5 (A1)				
1991 APR	BDL	BDL	BDL	.
1991 MAY	BDL	.050 <T	BDL	.
1991 JUN	BDL	.100 <T	.100 <T	.
1991 JUL	BDL	BDL	BDL	.
1991 AUG	BDL	BDL	.	.
1991 SEP	BDL	BDL	BDL	.
1991 OCT	BDL	BDL	BDL	.
1991 NOV	BDL	BDL	BDL	.
1991 DEC	BDL	BDL	BDL	.
1992 JAN	BDL	BDL	BDL	.
1992 FEB	BDL	BDL	BDL	.
1992 MAR	BDL	BDL	BDL	.
1992 APR	BDL	BDL	.	.
1992 MAY	BDL	BDL	BDL	.
1992 JUN	BDL	BDL	BDL	.
1992 JUL	BDL	BDL	BDL	.
1992 SEP	BDL	BDL	BDL	.
1992 OCT	BDL	BDL	BDL	.
1992 NOV	BDL	BDL	BDL	.
TOLUENE (UG/L)		DET'N LIMIT = 0.05		
GUIDELINE = 24 (A3)				
1991 APR	BDL	BDL	.050 <T	.
1991 MAY	BDL	.100 <T	.100 <T	.
1991 JUN	BDL	.350 <T	.350 <T	.
1991 JUL	BDL	.200 <T	.150 <T	.
1991 AUG	BDL	.100 <T	.	.
1991 SEP	BDL	BDL	.050 <T	.
1991 OCT	BDL	.100 <T	.100 <T	.
1991 NOV	BDL	.100 <T	.100 <T	.
1991 DEC	.050 <T	.100 <T	.100 <T	.
1992 JAN	BDL	.100 <T	.050 <T	.
1992 FEB	BDL	.100 <T	.050 <T	.
1992 MAR	BDL	.050 <T	.050 <T	.
1992 APR	BDL	.050 <T	.	.
1992 MAY	.050 <T	.100 <T	.050 <T	.
1992 JUN	BDL	.100 <T	.050 <T	.
1992 JUL	BDL	BDL	BDL	.
1992 SEP	BDL	BDL	.200 <T	.
1992 OCT	BDL	.150 <T	.	.
1992 NOV	BDL	.	.	.

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHAPLEAU WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM LANSDOWNE ST S FREE FLOW	DIST. SYSTEM LANSDOWNE ST S STANDING	
VOLATILES				
ETHYLBENZENE (UG/L)				GUIDELINE = 2.4 (A3)
DET'N LIMIT = 0.05				
1991 APR	BDL	BDL	BDL	*
1991 MAY	BDL	.100 <T	.050 <T	*
1991 JUN	BDL	.100 <T	.050 <T	*
1991 JUL	BDL	.100 <T	.050 <T	*
1991 AUG	BDL	.050 <T	.050 <T	*
1991 SEP	.100 <T	.100 <T	.150 <T	*
1991 OCT	.050 <T	.100 <T	.050 <T	*
1991 DEC	.100 <T	.150 <T	.100 <T	*
1992 JAN	.100 <T	.150 <T	.100 <T	*
1992 FEB	.050 <T	.200 <T	.100 <T	*
1992 MAR	.050 <T	.050 <T	.100 <T	*
1992 APR	BDL	.050 <T	*	*
1992 MAY	.100 <T	.100 <T	.100 <T	*
1992 JUL	BDL	.100 <T	.050 <T	*
1992 SEP	BDL	.100 <T	.050 <T	*
1992 NOV	.100 <T	.100 <T	.100 <T	*
P-XYLENE (UG/L)				GUIDELINE = 300 (A3*)
DET'N LIMIT = 0.10				
46 SAMPLES				
	BDL	BDL	BDL	*
M-XYLENE (UG/L)				GUIDELINE = 300 (A3*)
DET'N LIMIT = 0.10				
1991 APR	BDL	BDL	BDL	*
1991 MAY	BDL	.100 <T	.100 <T	*
1991 JUN	BDL	.100 <T	.100 <T	*
1991 JUL	BDL	.100 <T	BDL	*
1991 AUG	BDL	BDL	*	*
1991 SEP	BDL	BDL	BDL	*
1991 OCT	BDL	.300 <T	.100 <T	*
1991 DEC	BDL	BDL	.100 <T	*
1992 JAN	BDL	BDL	BDL	*
1992 FEB	BDL	.100 <T	.100 <T	*
1992 MAR	BDL	BDL	BDL	*
1992 APR	BDL	BDL	*	*
1992 MAY	.200 <T	BDL	BDL	*
1992 JUL	BDL	BDL	BDL	*
1992 SEP	BDL	.100 <T	BDL	*
1992 NOV	BDL	.200 <T	.100 <T	*

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHAPLEAU WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM LANSDOVNE ST S FREE FLOW	DIST. SYSTEM LANSDOVNE ST S STANDING	
VOLATILES				
O-XYLENE (UG/L)		DET'N LIMIT = 0.05	GUIDELINE = 300 (A3*)	
1991 APR	BDL	BDL	-	
1991 MAY	.050 <T	.050 <T	-	
1991 JUN	BDL	.050 <T	-	
1991 JUL	BDL	.050 <T	-	
1991 AUG	BDL	BDL	-	
1991 SEP	BDL	BDL	-	
1991 OCT	BDL	.150 <T	-	
1991 DEC	BDL	.050 <T	-	
1992 JAN	BDL	BDL	-	
1992 FEB	BDL	BDL	-	
1992 MAR	BDL	BDL	-	
1992 APR	BDL	BDL	-	
1992 MAY	.050 <T	BDL	-	
1992 JUL	BDL	BDL	-	
1992 SEP	BDL	.050 <T	-	
1992 NOV	BDL	.050 <T	-	
STYRENE (UG/L)				
		DET'N LIMIT = 0.05	GUIDELINE = 100 (D1)	
1991 APR	BDL	BDL	-	
1991 MAY	BDL	.100 <T	-	
1991 JUN	BDL	.050 <T	-	
1991 JUL	BDL	.150 <T	-	
1991 AUG	BDL	.050 <T	-	
1991 SEP	.150 <T	.200 <T	-	
1991 OCT	.100 <T	.050 <T	-	
1991 DEC	.300 <T	.250 <T	-	
1992 JAN	.250 <T	.200 <T	-	
1992 FEB	.100 <T	.400 <T	-	
1992 MAR	BDL	BDL	-	
1992 APR	BDL	.050 <T	-	
1992 MAY	.100 <T	.100 <T	-	
1992 JUL	BDL	.050 <T	-	
1992 SEP	.050 <T	.100 <T	-	
1992 NOV	.150 <T	.150 <T	-	
1,1-DICHLOROETHYLENE (UG/L)				
		DET'N LIMIT = 0.100	GUIDELINE = 7 (D1)	
46 SAMPLES	BDL	BDL	-	

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHAPLEAU WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM LANSOUDNE ST S FREE FLOW	DIST. SYSTEM LANSOUDNE ST S STANDING	
VOLATILES				
METHYLENE CHLORIDE (UG/L)		DET'N LIMIT = 0.50	GUIDELINE = 50 (A1)	
1991 APR	BDL	BDL	BDL	
1991 MAY	BDL	BDL	BDL	
1991 JUN	BDL	BDL	BDL	
1991 JUL	BDL	BDL	BDL	
1991 AUG	BDL	BDL	BDL	
1991 SEP	BDL	BDL	BDL	
1991 OCT	BDL	BDL	BDL	
1991 DEC	BDL	BDL	BDL	
1992 JAN	BDL	BDL	BDL	
1992 FEB	BDL	BDL	BDL	
1992 MAR	BDL	BDL	BDL	
1992 APR	BDL	BDL	BDL	
1992 MAY	BDL	BDL	BDL	
1992 JUN	BDL	BDL	BDL	
1992 JUL	BDL	BDL	BDL	
1992 SEP	BDL	BDL	BDL	
1992 NOV	BDL	BDL	BDL	
T12-DICHLOROETHYLENE (UG/L)		DET'N LIMIT = 0.10	GUIDELINE = 70 (D1)	
46 SAMPLES	BDL	BDL		
1,1-DICHLOROETHANE (UG/L)		DET'N LIMIT = 0.100	GUIDELINE = N/A	
46 SAMPLES	BDL	BDL		
CHLOROFORM (UG/L)		DET'N LIMIT = 0.10	GUIDELINE = 350 (A1+)	
1991 APR	.200 <T	7.600	6.500	
1991 MAY	.200 <T	11.500	11.300	
1991 JUN	BDL	6.900	5.800	
1991 JUL	BDL	13.200	1.100	
1991 AUG	BDL	35.000		
1991 SEP	BDL	10.900	9.200	
1991 OCT	BDL	4.600	4.100	
1991 DEC	BDL	3.500	3.100	
1992 JAN	BDL	3.300	2.000	
1992 FEB	BDL	1.200	.500 <T	
1992 MAR	BDL	6.200	3.600	
1992 APR	BDL	6.200		
1992 MAY	BDL	7.500	6.900	
1992 JUN	BDL	6.400	4.900	
1992 JUL	BDL	5.200	4.600	
1992 SEP	BDL	5.300	3.400	
1992 NOV	BDL			

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHAPLEAU WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM LANSDOUNE ST S FREE FLOW	DIST. SYSTEM LANSDOUNE ST S STANDING
VOLATILES			
1,1,1 TRICHLOROETHANE (UG/L)			
		DET'N LIMIT = 0.02	GUIDELINE = 200 (D1)
1991 APR	BOL	BOL	-
1991 MAY	BOL	BOL	-
1991 JUN	BOL	BOL	-
1991 JUL	BOL	BOL	-
1991 AUG	BOL	BOL	-
1991 SEP	BOL	BOL	-
1991 OCT	BOL	BOL	-
1991 DEC	BOL	BOL	-
1992 JAN	BOL	BOL	-
1992 FEB	BOL	BOL	-
1992 MAR	BOL	BOL	-
1992 APR	BOL	BOL	-
1992 MAY	BOL	BOL	-
1992 JUL	BOL	BOL	-
1992 SEP	BOL	BOL	-
1992 NOV	BOL	BOL	-
1,2 DICHLOROETHANE (UG/L)			
		DET'N LIMIT = 0.05	GUIDELINE = 5 (A1)
1991 APR	BOL	BOL	-
1991 MAY	BOL	BOL	-
1991 JUN	BOL	BOL	-
1991 JUL	BOL	BOL	-
1991 AUG	BOL	BOL	-
1991 SEP	BOL	BOL	-
1991 OCT	BOL	BOL	-
1991 DEC	BOL	BOL	-
1992 JAN	BOL	BOL	-
1992 FEB	BOL	BOL	-
1992 MAR	BOL	BOL	-
1992 APR	BOL	BOL	-
1992 MAY	BOL	BOL	-
1992 JUL	BOL	BOL	-
1992 SEP	BOL	BOL	-
1992 NOV	BOL	BOL	-
CARBON TETRACHLORIDE (UG/L)			
		DET'N LIMIT = 0.20	GUIDELINE = 5 (A1)
46 SAMPLES	BOL	BOL	-
1,2-DICHLOROPROPANE (UG/L)			
		DET'N LIMIT = 0.05	GUIDELINE = 5 (D1)
46 SAMPLES	BOL	BOL	-

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHAPLEAU WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM LANDOWNE ST S FREE FLOW	DIST. SYSTEM LANDOWNE ST S STANDING
VOLATILES			
TRICHLOROETHYLENE (UG/L)		DET'N LIMIT = 0.10	GUIDELINE = 50 (A1)
46 SAMPLES	BDL	BDL	
DICHLOROBROMOMETHANE (UG/L)		DET'N LIMIT = 0.05	GUIDELINE = 350 (A1+)
1991 APR	BDL	.200 <T	
1991 MAY	BDL	.200 <T	
1991 JUN	BDL	BDL	
1991 JUL	BDL	.400 <T	
1991 AUG	BDL	1.150	
1991 SEP	BDL	.350 <T	
1991 OCT	BDL	.150 <T	
1991 DEC	BDL	.150 <T	
1992 JAN	BDL	BDL	
1992 FEB	BDL	BDL	
1992 MAR	BDL	BDL	
1992 APR	BDL	.200 <T	
1992 MAY	BDL	BDL	
1992 JUL	BDL	BDL	
1992 SEP	BDL	BDL	
1992 NOV	BDL	.200 <T	
112-TRICHLOROETHANE (UG/L)		DET'N LIMIT = 0.05	GUIDELINE = 0.6 (D4)
46 SAMPLES	BDL	BDL	
CHLORODIBROMOMETHANE (UG/L)		DET'N LIMIT = 0.10	GUIDELINE = 350 (A1+)
46 SAMPLES	BDL	BDL	
TETRACHLOROETHYLENE (UG/L)		DET'N LIMIT = 0.05	GUIDELINE = 65 (A5)
46 SAMPLES	BDL	BDL	
BROMOFORM (UG/L)		DET'N LIMIT = 0.20	GUIDELINE = 350 (A1+)
46 SAMPLES	BDL	BDL	
1122-TETRACHLOROETHANE (UG/L)		DET'N LIMIT = 0.05	GUIDELINE = 0.17 (D4)
46 SAMPLES	BDL	BDL	
VINYL CHLORIDE (UG/L)		DET'N LIMIT = 0.100	GUIDELINE = 2 (D1)
20 SAMPLES	BDL	BDL	

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHAPLEAU WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM LANDSOWNE ST S FREE FLOW	DIST. SYSTEM LANDSOWNE ST S STANDING	
VOLATILES				
C12-DICHLOROETHYLENE (UG/L)				
20 SAMPLES	BDL	BDL	BDL	GUIDELINE = 70 (01)
CHLOROBENZENE (UG/L)				
46 SAMPLES	BDL	BDL	BDL	GUIDELINE = 1510 (03)
1,4-DICHLOROBENZENE (UG/L)				
46 SAMPLES	BDL	BDL	BDL	GUIDELINE = 5 (A1)
1,3-DICHLOROBENZENE (UG/L)				
46 SAMPLES	BDL	BDL	BDL	GUIDELINE = 3750 (03)
1,2-DICHLOROBENZENE (UG/L)				
46 SAMPLES	BDL	BDL	BDL	GUIDELINE = 200 (A1)
ETHYLENE DIBROMIDE (UG/L)				
46 SAMPLES	BDL	BDL	BDL	GUIDELINE = 50 (01)
TOTL TRIHALOMETHANES (UG/L)				
1991 APR	BDL	7,800	6,650	GUIDELINE = 350 (A1)
1991 MAY	BDL	11,700	11,500	
1991 JUN	BDL	6,900	5,800	
1991 JUL	BDL	13,600	1,100 <T	
1991 AUG	BDL	36,150		
1991 SEP	BDL	11,250	9,500	
1991 OCT	BDL	4,750 <T	4,250 <T	
1991 DEC	BDL	3,650 <T	3,100 <T	
1992 JAN	BDL	3,300 <T	2,000 <T	
1992 FEB	BDL	1,200 <T	500 <T	
1992 MAR	BDL	6,200	3,600 <T	
1992 APR	BDL	6,400		
1992 MAY	BDL	7,500	6,900	
1992 JUL	BDL	6,400	4,900 <T	
1992 SEP	BDL	5,200	4,600 <T	
1992 NOV	BDL	5,500	3,400 <T	

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 CHAPLEAU WTP

TREATMENT PLANT RAW	TREATMENT PLANT TREATED	DIST. SYSTEM LANSLOWNE ST S FREE FLOW	DIST. SYSTEM LANSLOWNE ST S STANDING	
RADIONUCLIDES				
COBALT 60 (BQ/L)		DET'N LIMIT = 0.70	GUIDELINE = N/A	
9 SAMPLES	BDL			
CESIUM 134 (BQ/L)		DET'N LIMIT = 0.70	GUIDELINE = N/A	
9 SAMPLES	BDL			
CESIUM 137 (BQ/L)		DET'N LIMIT = 0.70	GUIDELINE = 50 (A1)	
9 SAMPLES	BDL			
GROSS ALPHA COUNT (BQ/L)		DET'N LIMIT = 0.04	GUIDELINE = 0.55 (D1)	
9 SAMPLES	BDL			
GROSS BETA COUNT (BQ/L)		DET'N LIMIT = 0.04	GUIDELINE = N/A	
1991 APR	.240			
1991 SEP	.060			
1991 DEC	.050			
1992 FEB	.050			
1992 SEP	.060			
TRITIUM (BQ/L)		DET'N LIMIT = 7.00	GUIDELINE = 40000 (A1)	
9 SAMPLES	BDL			
IODINE 131 (BQ/L)		DET'N LIMIT = 0.70	GUIDELINE = 10 (A1)	
9 SAMPLES	BDL			

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992

SCAN/PARAMETER -----	UNIT ----	DETECTION LIMIT -----	GUIDELINE -----
BACTERIOLOGICAL			
FECAL COLIFORM MEMBRANE FILTRATION	CT/100ML	0	0 (A1)
STANDARD PLATE COUNT MEMBRANE FILT.	CT/ML	0	500/ML (A3)
TOTAL COLIFORM BACKGROUND MF	CT/100ML	0	N/A
TOTAL COLIFORM MEMBRANE FILTRATION	CT/100ML	0	5/100ML (A1)
CHEMISTRY (FLD)			
FIELD COMBINED CHLORINE RESIDUAL	MG/L	0	N/A
FIELD TOTAL CHLORINE RESIDUAL	MG/L	0	N/A
FIELD FREE CHLORINE RESIDUAL	MG/L	0	N/A
FIELD PH	DMNSLESS	N/A	6.5-8.5 (A4)
FIELD TEMPERATURE	DEG.C	N/A	15.0 (A3)
FIELD TURBIDITY	FTU	N/A	1.0 (A1)
CHEMISTRY (LAB)			
ALKALINITY	MG/L	0.20	30-500 (A4)
AMMONIUM TOTAL	MG/L	0.002	0.05 (F2)
CALCIUM	MG/L	0.20	100.0 (F2)
CHLORIDE	MG/L	0.20	250.0 (A3)
COLOUR	TCU	0.50	5.0 (A3)
CONDUCTIVITY	UMHO/CM	1.00	400.0 (F2)
CYANIDE	MG/L	0.001	0.2 (A1)
DISSOLVED ORGANIC CARBON	MG/L	0.10	5.0 (A3)
FLUORIDE	MG/L	0.01	1.5* (A1)
HARDNESS	MG/L	0.50	80-100 (A4)
IONCAL	DMNSLESS	N/A	N/A
LANGELIERS INDEX	DMNSLESS	N/A	N/A
MAGNESIUM	MG/L	0.10	30.0 (F2)
NITRATES (TOTAL)	MG/L	0.005	10.0 (A1)
NITRITE	MG/L	0.001	1.0 (A1)
NITROGEN TOTAL KJELDAHL	MG/L	0.02	N/A
PH	DMNSLESS	N/A	6.5-8.5 (A4)
PHOSPHORUS FIL REACT	MG/L	0.0005	N/A
PHOSPHORUS TOTAL	MG/L	0.002	0.4 (F2)
POTASSIUM	MG/L	0.010	10.0 (F2)
RESIDUE FILTRATE (CALCULATED TDS)	MG/L	N/A	500.0 (A3)
SODIUM	MG/L	0.20	200.0 (A4)
SULPHATE	MG/L	0.20	500.0 (A4)
TURBIDITY	FTU	0.05	1.0 (A1)
* The Maximum Acceptable Concentration (MAC) for <u>naturally occurring fluoride</u> in drinking water is 2.4 mg/L.			
CHLOROAROMATICS			
1,2,3-TRICHLOROBENZENE	NG/L	5.0	N/A
1,2,3,4-TETRACHLOROBENZENE	NG/L	1.0	N/A
1,2,3,5-TETRACHLOROBENZENE	NG/L	1.0	N/A
1,2,4-TRICHLOROBENZENE	NG/L	5.0	10000 (1)
1,2,4,5-TETRACHLOROBENZENE	NG/L	1.0	38000 (D4)
1,3,5-TRICHLOROBENZENE	NG/L	5.0	N/A
2,3,6-TRICHLOROTOLUENE	NG/L	5.0	N/A
2,4,5-TRICHLOROTOLUENE	NG/L	5.0	N/A
2,6A-TRICHLOROTOLUENE	NG/L	5.0	N/A
HEXACHLOROBENZENE (HCB)	NG/L	1.0	10 (C1)
HEXACHLOROBUTADIENE	NG/L	1.0	450 (D4)
HEXACHLOROETHANE	NG/L	1.0	1900 (D4)
OCTACHLOROSTYRENE	NG/L	1.0	N/A
PENTACHLOROBENZENE	NG/L	1.0	74000 (D4)
CHLOROPHENOLS			
2,3,4-TRICHLOROPHENOL	NG/L	100.0	N/A
2,3,4,5-TETRACHLOROPHENOL	NG/L	20.0	N/A
2,3,5,6-TETRACHLOROPHENOL	NG/L	10.0	N/A

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE
2,4,5-TRICHLOROPHENOL	NG/L	100.0	2600000 (D4)
2,4,6-TRICHLOROPHENOL	NG/L	20.0	5000 (A1)
PENTACHLOROPHENOL	NG/L	10.0	60000 (A1)
METALS			
ALUMINUM	UG/L	0.10	100 (A4)
ANTIMONY	UG/L	0.05	146 (D4)
ARSENIC	UG/L	0.10	25 (A1)
BARIUM	UG/L	0.05	1000 (A2)
BERYLLIUM	UG/L	0.05	6800 (D4)
BORON	UG/L	2.00	5000 (A1)
CADMIUM	UG/L	0.05	5 (A1)
CHROMIUM	UG/L	0.50	50 (A1)
COBALT	UG/L	0.02	N/A
COPPER	UG/L	0.50	1000 (A3)
IRON	UG/L	6.00	300 (A3)
LEAD	UG/L	0.05	10 (A1)
MANGANESE	UG/L	0.05	50 (A3)
MERCURY	UG/L	0.02	1 (A1)
MOLYBDENUM	UG/L	0.05	N/A
NICKEL	UG/L	0.20	350 (D3)
SELENIUM	UG/L	1.00	10 (A1)
SILVER	UG/L	0.05	N/A
STRONTIUM	UG/L	0.10	N/A
THALLIUM	UG/L	0.05	13 (D4)
TITANIUM	UG/L	0.50	N/A
URANIUM	UG/L	0.05	100 (A1)
VANADIUM	UG/L	0.05	N/A
ZINC	UG/L	0.20	5000 (A3)
POLYNUCLEAR AROMATIC HYDROCARBONS			
ANTHRACENE	NG/L	1.0	N/A
BENZO(A) ANTHRACENE	NG/L	20.0	N/A
BENZO(A) PYRENE	NG/L	5.0	10 (A1)
BENZO(B) CHRYSENE	NG/L	2.0	N/A
BENZO(B) FLUORANTHENE	NG/L	10.0	N/A
BENZO(E) PYRENE	NG/L	50.0	N/A
BENZO(G,H,I) PERYLENE	NG/L	20.0	N/A
BENZO(K) FLUORANTHENE	NG/L	1.0	N/A
CHRYSENE	NG/L	50.0	N/A
CORONENE	NG/L	10.0	N/A
DIBENZO(A,H) ANTHRACENE	NG/L	10.0	N/A
DIMETHYL BENZO(A) ANTHRACENE	NG/L	5.0	N/A
FLUORANTHENE	NG/L	20.0	42000 (D4)
INDENO(1,2,3-C,D) PYRENE	NG/L	20.0	N/A
PERYLENE	NG/L	10.0	N/A
PHENANTHRENE	NG/L	10.0	N/A
PYRENE	NG/L	20.0	N/A
PESTICIDES & PCB			
ALACHLOR (LASSO)	NG/L	500.0	5000 (A2)
ALDRIN	NG/L	1.0	700 (A1)
ALPHA HEXACHLOROCYCLOHEXANE (BHC)	NG/L	1.0	700 (G)
ALPHA CHLORDANE	NG/L	2.0	7000 (A1)
AMETRINE	NG/L	50.0	300000 (D3)
ATRAZONE	NG/L	50.0	N/A
ATRAZINE	NG/L	50.0	60000 (A2)
DESETHYL ATRAZINE	NG/L	200.0	60000 (A2)
BETA HEXACHLOROCYCLOHEXANE (BHC)	NG/L	1.0	300 (G)
CYANAZINE (BLADEX)	NG/L	100.0	10000 (A2)
DIELDRIN	NG/L	2.0	700 (A1)
ENDOSULFAN 1 (THIODAN I)	NG/L	2.0	74000 (D4)
ENDOSULFAN 2 (THIODAN II)	NG/L	5.0	74000 (D4)
ENDOSULFAN SULPHATE (THIODAN SULPHATE)	NG/L	5.0	N/A

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE
-----	----	-----	-----
ENDRIN	NG/L	5.0	1600 (D3)
GAMMA CHLORDANE	NG/L	2.0	7000 (A1)
HEPTACHLOR	NG/L	1.0	3000 (A1)
HEPTACHLOR EPOXIDE	NG/L	1.0	3000 (A1)
HEXACHLOROCYCLOPENTADIENE	NG/L	5.0	206000 (D4)
LINDANE (GAMMA BHC)	NG/L	1.0	4000 (A1)
METHOXYCHLOR	NG/L	5.0	900000 (A1)
METOLACHLOR	NG/L	500.0	50000 (A2)
METRIBUZIN (SENCOR)	NG/L	100.0	80000 (A1)
MIREX	NG/L	5.0	N/A
P,P-DDD	NG/L	5.0	30000 (A1)
O,P-DDT	NG/L	5.0	30000 (A1)
P,P-DDT	NG/L	5.0	30000 (A1)
P,P-DDE	NG/L	1.0	30000 (A1)
OXYCHLORDANE	NG/L	2.0	N/A
PCB	NG/L	20.0	3000 (A2)
PROMETONE	NG/L	50.0	52500 (D3)
PROMETRYNE	NG/L	50.0	1000 (A2)
PROPAZINE	NG/L	50.0	700000 (D3)
SIMAZINE	NG/L	50.0	10000 (A2)
DESETHYL SIMAZINE	NG/L	200.0	10000 (A2)
TOXAPHENE	NG/L	500.0	5000 (A1)
PHENOLICS			
PHENOLICS (UNFILTERED REACTIVE)	UG/L	0.2	N/A
SPECIFIC PESTICIDES			
2,4 D PROPIONIC ACID	NG/L	100.0	N/A
2,4,5-TRICHLOROPHENOXY ACETIC ACID	NG/L	50.0	280000 (A1)
2,4-DICHLOROBUTYRIC ACID (2,4-D)	NG/L	100.0	100000 (A1)
2,4-DICHLOROPHENOXYBUTYRIC ACID (2,4-DB)	NG/L	200.0	N/A
2,4,5-TP (SILVEX)	NG/L	20.0	10000 (A1)
BUTYLATE (SUTAN)	NG/L	2000.0	245000 (D3)
CARBARYL (SEVIN)	NG/L	200.0	90000 (A1)
CARBOFURAN	NG/L	2000.0	90000 (A1)
CHLOROPROPHAM (CIPC)	NG/L	2000.0	350000 (G)
CHLORPYRIFOS (DURSBAN)	NG/L	20.0	N/A
DIALLATE	NG/L	2000.0	N/A
DIAZINON	NG/L	20.0	20000 (A1)
DICAMBA	NG/L	50.0	120000 (A1)
DICHLOROVOS	NG/L	20.0	N/A
EPTAM	NG/L	2000.0	N/A
ETHION	NG/L	20.0	35000 (G)
IPC	NG/L	2000.0	N/A
MALATHION	NG/L	20.0	190000 (A1)
METHYL PARATHION	NG/L	50.0	9000 (D3)
METHYLTRITHION	NG/L	20.0	N/A
MEVINPHOS	NG/L	20.0	N/A
PARATHION	NG/L	20.0	50000 (A1)
PHORATE (THIMET)	NG/L	20.0	2000 (A2)
PICHLORAM	NG/L	100.0	190000 (A2)
PROPOXUR (BAYGON)	NG/L	2000.0	140000 (D3)
RELDAN	NG/L	20.0	N/A
RONNEL	NG/L	20.0	N/A
VOLATILES			
1,1-DICHLOROETHANE	UG/L	0.10	N/A
1,1-DICHLOROETHYLENE	UG/L	0.10	7 (D1)
1,2-DICHLOROBENZENE	UG/L	0.05	200 (A1)
1,2-DICHLOROETHANE	UG/L	0.05	5 (A1)
1,2-DICHLOROPROPANE	UG/L	0.05	5 (D1)
1,3-DICHLOROBENZENE	UG/L	0.10	3750 (D3)
1,4-DICHLOROBENZENE	UG/L	0.10	5 (A1)
1,1,1-TRICHLOROETHANE	UG/L	0.02	200 (D1)
1,1,2-TRICHLOROETHANE	UG/L	0.05	0.6 (D4)
1,1,2,2-TETRACHLOROETHANE	UG/L	0.05	0.17 (D4)

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE
BENZENE	UG/L	0.05	5 (A1)
BROMOFORM	UG/L	0.20	350 (A1+)
CARBON TETRACHLORIDE	UG/L	0.20	5 (A1)
CHLOROBENZENE	UG/L	0.10	1510 (D3)
CHLORODIBROMOMETHANE	UG/L	0.10	350 (A1+)
CHLOROFORM	UG/L	0.10	350 (A1+)
CIS 1,2-DICHLOROETHYLENE	UG/L	0.10	70 (D1)
DICHLOROBROMOMETHANE	UG/L	0.05	350 (A1+)
ETHYLENE DIBROMIDE	UG/L	0.05	50 (D1)
ETHYLENEBENZENE	UG/L	0.05	2.4 (A3)
M-XYLENE	UG/L	0.10	300 (A3*)
METHYLENE CHLORIDE	UG/L	0.50	50 (A1)
O-XYLENE	UG/L	0.05	300 (A3*)
P-XYLENE	UG/L	0.10	300 (A3*)
STYRENE	UG/L	0.05	100 (D1)
TETRACHLOROETHYLENE	UG/L	0.05	65 (A5)
TRANS 1,2-DICHLOROETHYLENE	UG/L	0.10	70 (D1)
TOLUENE	UG/L	0.05	24 (A3)
TOTAL TRIHALOMETHANES	UG/L	0.50	350 (A1)
TRICHLOROETHYLENE	UG/L	0.10	50 (A1)
VINYL CHLORIDE	UG/L	0.10	2 (D1)
RADIONUCLIDES			
TRITIUM	BQ/L	7.0	40000 (A1)
GROSS ALPHA COUNT	BQ/L	0.04	0.55# (D1)
GROSS BETA COUNT	BQ/L	0.04	N/A
COBALT 60	BQ/L	0.70	N/A
CESIUM 134	BQ/L	0.70	N/A
CESIUM 137	BQ/L	0.70	50 (A1)
IODINE 131	BQ/L	0.70	10 (A1)

Equal to 15.0 Picocuries/litre

Appendix A

DRINKING WATER SURVEILLANCE PROGRAM PROGRAM DESCRIPTION

The Drinking Water Surveillance Program (DWSP) for Ontario monitors drinking water quality at municipal water supply systems. The DWSP Database Management System provides a computerized drinking water quality information system for the supplies monitored. The objectives of the program are to provide:

- immediate, reliable, current information on drinking water quality;
- a flagging mechanism for guideline exceedance;
- a definition of contaminant levels and trends;
- a comprehensive background for remedial action;
- a framework for assessment of new contaminants; and
- an indication of treatment efficiency of plant processes.

PROGRAM

The DWSP officially began in April 1986 and is designed to eventually include all municipal water supplies in Ontario. In 1992, 109 systems were being monitored. Water supply locations have been prioritized for surveillance based primarily on criteria such as population density, probability of contamination and geographical location.

An ongoing assessment of future monitoring requirements at each location will be made. Monitoring will continue at the initial locations at an appropriate level and further locations will be phased into the program as resources permit.

A major goal of the program is to collect valid water quality data in context with plant operational characteristics at the time of sampling. As soon as sufficient data have been accumulated and analyzed, both the frequency of sampling and the range of parameters may be adjusted accordingly.

Assessments are carried out at all locations prior to initial sampling, in order to acquire complete plant process and distribution system details and to designate (and retrofit if necessary) all sampling systems and locations. This ensures that the sampled water is a reflection of the water itself.

Samples are taken of raw (ambient water) and treated water at the treatment plant and of consumer's tap water in the distribution system. In order to determine possible effects of distribution on water quality, both standing and free flow water in old and new sections of the distribution system are sampled. Sampling is carried out by operational personnel who have been trained in applicable procedures.

Comprehensive standardized procedures and field test kits are supplied to sampling personnel. This ensures that samples are taken and handled according to standard protocols and that field testing will supply reliable data. All field and laboratory analyses are carried out using "approved documented procedures". Most laboratory analyses are carried out by the Ministry of Environment and Energy (MOEE), Laboratory Services Branch. Radionuclides are analyzed by the Ministry of Labour.

DATA REPORTING MECHANISM

When the analytical results are transferred from the MOEE laboratory into the DWSP system, printouts of the completed analyses are sent to the MOEE District Officer, the appropriate operational staff and are also retained by the DWSP unit.

PROGRAM INPUTS AND OUTPUTS

There are four major inputs and four major outputs in the program.

Program Input - Plant and Distribution System Description

The system description includes plant specific non-analytical information acquired through a questionnaire and an initial plant visit. During the initial assessment of the plant and distribution system, questionnaire content is verified and missing information added. It is intended that all data be kept current with scheduled annual updates.

The Plant and Distribution System Description consists of the following seven components:

1. PROCESS COMPONENT INVENTORY

All physical and chemical processes to which the water is subjected, from the intake pipe to the consumers' tap (where possible), are documented. These include: process type, general description of physical structures, material types, sizes, and retention time for each process within the plant. The processes may be as simple as transmission or as complex as carbon adsorption.

2. TREATMENT CHEMICALS

Chemicals used in the treatment processes, their function, application point, supplier and brand-name are recorded. Chemical dosages applied on the day of sampling are recorded in DWSP.

3. PROCESS CONTROL MEASUREMENTS

Documentation of in-plant monitoring of process parameters (eg. turbidity, chlorine residuals, pH, aluminum residuals) including methods used, monitoring locations and frequency is contained in this section. Except for the recorded Field Data, in-plant monitoring results are not retained in DWSP but are retained by the water treatment plant personnel.

4. DESIGN FLOW AND RETENTION TIME

Hydraulic capacity, designed and actual, is noted here. Retention time (the time that a block of water is retained in the plant) is also noted. Maximum, minimum and average flow, as well as a record of the flow rate on the day of sampling, are recorded in DWSP.

5. DISTRIBUTION SYSTEM DESCRIPTION

This area includes the storage and transmission characteristics of the distribution system after the water leaves the plant.

6. SAMPLING SYSTEM

Each plant is assessed for its adequacy in terms of the sampling of bacteriological, organic and inorganic parameters. Prime considerations in the assessment and design of the sampling system are:

- i/ the sample is an accurate representation of the actual water condition, eg. raw water has had no chemical treatment;
- ii/ the water being sampled is not being modified by the sampling system;
- iii/ the sample tap must be in a clean area of the plant, preferably a lab area; and
- iv/ the sample lines must be organically inert (no plastic, ideally stainless steel).

It is imperative that the sampled water be a reflection not of the sampling system but of the water itself.

The sampling system documentation includes: origin of the water; date sampling was initiated; size, length and material type (intake, discharge and tap); pump characteristics (model, type, capacity); and flow rate.

7. PERSONNEL

This section contains the names, addresses and phone numbers of current plant management and operational staff, distribution system management and operational staff, Medical Officer of Health and appropriate MOEE personnel associated with the plant.

Program Input - Field Data

The second major input to DWSP is field data. Field data is collected at the plant and from the distribution system sites on the day of sampling. Field data consists of general operating conditions and the results of testing for field parameters. General operating conditions include chemicals used, dosages, flow and retention time on the day of sampling, as well as, monthly maximum, minimum and average flows. Field parameters include turbidity, chlorine residuals (free, combined and total), temperature and pH. These parameters are analyzed according to standardized DWSP protocols to allow for interplant comparison.

Program Input - Laboratory Analytical Data

The third major input to DWSP is Laboratory Analytical Data. Samples gathered from the raw, treated and distribution sampling sites are analyzed for the presence of approximately 180 parameters at a frequency of two to twelve times per year. Sixty-five percent of the parameters are organic. Parameters measured may have health or aesthetic implications when present in drinking water. Many of the parameters may be used in the treatment process or may be treatment by-products. Due to the nature of certain analytical instruments, parameters may be measured in a "scan" producing some results for parameters that are not on the DWSP priority list, but which may be of interest. The majority of parameters are measured on a routine basis. Those that are technically more difficult and/or costly to analyze, however, are done less frequently. These include Specific Pesticides and Chlorophenols.

Although the parameter list is extensive, additional parameters with the potential to cause health or aesthetic related problems may be added provided reliable analytical and sampling methods exist.

All laboratory generated data is derived from standardized, documented analytical protocols. The analytical method is an integral part of the data and as methods change, notation will be made and comparison data documented.

Program Input - Parameter Reference Information

The fourth major input to DWSP is Parameter Reference Information. This is a catalogue of information for each substance analyzed on DWSP. It includes parameter name and aliases, physical and chemical properties, basic toxicology, world-wide health limits, treatment methods and uses. The Parameter Reference Information is computerized and can be accessed through the Query function of the DWSP database. An example is shown in figure 1.

Program output - Query

All DWSP information is easily accessed through the Query function, therefore, anything from addresses of plant personnel to complete water quality information for a plant's water supply is instantly available. The DWSP computer system makes relatively complex inquiries manageable. A personal password allowing access into the DWSP query mode in all MOEE offices is being developed by the DWSP group.

Program Output - Action Alerts

Drinking Water quality in Ontario is evaluated against provincial objectives as outlined in the Ontario Drinking Water Objectives publication. Should the reported level of a substance in treated water exceed the Ontario Drinking Water Objective, an "Action Alert" requiring resampling and confirmation is issued. This assures that operational staff, health authorities and the public are notified as soon as possible of the confirmation of an exceedance and remedial action taken. This report supplies a history of the occurrence of past exceedances at the plant plus a historical summary on the parameter of concern.

In the absence of Ontario Drinking Water Objectives, guidelines/limits from other agencies are used. The Parameter Listing System, published by MOEE (ISBN 0-7729-4461-X), catalogues and keeps current guidelines for 650 parameters from agencies throughout the world. If these guidelines are exceeded, the results are flagged and evaluated by DWSP personnel. An "Action Alert" will be issued if warranted.

Program Output - Report Generation

Custom reports can be generated from DWSP to meet MOEE Regional needs and to respond to public requests.

Program Output - Annual Reports

It is the practice of DWSP to produce an annual report containing analytical data along with companion plant information.

FIG.1

PARAMETER REFERENCE INFORMATION

NAME: BENZENE

CAS#: 71-43-2

MOLECULAR FORMULAE: C_6H_6

DETECTION LIMIT: (FOR METHOD POCODO) 0.05 $\mu g/L$

SYNONYMS: BENZOL; BENZOLE; COAL NAPHTHA; CARBON OIL (27)
CYCLOHEXATRIENE (41)

CHARACTERISTICS: COLOURLESS TO LIGHT-YELLOW, MOBILE, NONPOLAR LIQUID, OF
HIGHLY REFRACTIVE NATURE, AROMATIC ODOUR; VAPOURS BURN
WITH SMOKING FLAME (30)

PROPERTIES: SOLUBILITY IN WATER: 1780-1800 mg/L AT 25C (41)
THRESHOLD ODOUR: 0.5 - 10 PPM IN WATER
THRESHOLD TASTE: 0.5 mg/L IN WATER (39)
ENVIRONMENTAL FATE: MAY BIOACCUMULATE IN LIVING ORGANISMS
AND APPEARS TO ACCUMULATE IN ANIMAL TISSUES THAT EXHIBIT
A HIGH LIPID CONTENT OR REPRESENT MAJOR METABOLIC SITES,
SUCH AS LIVER OR BRAIN; SMALL QUANTITIES EVAPORATE FROM
SOILS OR ARE DEGRADED RATHER QUICKLY (80)

SOURCES: COMMERCIAL: PETROLEUM REFINING; SOLVENT RECOVERY; COAL TAR
DISTILLATION (39); FOOD PROCESSING AND TANNING INDUSTRIES;
COMBUSTION OF CAR EXHAUST.
ENVIRONMENTAL: POSSIBLE SOURCE IS RUNOFF.

USES: DETERGENTS; NYLON; INTERMEDIATE IN PRODUCTION OF OTHER
COMPOUNDS, SUCH AS PESTICIDES; SOLVENT FOR EXTRACTION AND
RECTIFICATION IN RUBBER INDUSTRY; DEGREASING AND CLEANSING
AGENT; GASOLINE.

REMOVAL: THE FOLLOWING PROCESSES HAVE BEEN SUCCESSFUL IN REMOVING
BENZENE FROM WASTEWATER: GAC ADSORPTION, PRECIPITATION
WITH ALUM AND SUBSEQUENT REMOVAL VIA SEDIMENTATION,
COAGULATION AND FLOCCULATION, SOLVENT EXTRACTION,
OXIDATION

ADDITIONAL PROPERTIES: MOLECULAR WEIGHT: 78.12
MELTING POINT: 5.5°C (27)
BOILING POINT: 80.1°C (27)
SPECIFIC GRAVITY: 0.8790 AT 20°C (27)
VAPOUR PRESSURE: 100 MM AT 26.1°C (27)
HENRY'S LAW CONSTANT: 0.00555 ATM-M³/MOLE (41)
LOG OCT./WATER PARTITION COEFFICIENT: 1.95 TO 2.13 (39)
CARBON ADSORPTION: K=1.0; 1/N=1.6; R=0.97; PH=5.3 (41)
SEDIMENT/WATER PARTITION COEFFICIENT: NO DATA

DWSP SAMPLING GUIDELINE

i) Raw and Treated at Plant

General Chemistry	-500 mL plastic bottle (PET 500) -rinse bottle and cap with sample water three times -fill to 2 cm from top
Bacteriological	-220 mL plastic bottle with white seal on cap -do <u>not</u> rinse bottle, preservative has been added -avoid touching bottle neck or inside of cap -fill to top of red label as marked
Metals	-500 mL plastic bottle (PET 500) -rinse bottle and cap three times -fill to 2 cm from top -add 10 drops nitric acid (HNO_3) (Caution: HNO_3 is corrosive)
Volatiles (duplicates) (OPOPUP)	-45 mL glass vial with septum (teflon side must be in contact with sample). -do <u>not</u> rinse bottle -fill bottle completely without bubbles
Organics (OWOC), (OWTRI)	-1 L amber glass bottle per scan -do <u>not</u> rinse bottle -fill to 2 cm from top
Specific Pesticides (OWCP), (PEOP), (PECAR)	-as per Organics -three extra bottles must be filled
Polyaromatic hydrocarbons (OAPAHX)	-1 L amber glass bottle per scan -do <u>not</u> rinse bottle -fill to 2 cm from top -add 25 drops of sodium thiosulphate
Cyanide (Treated only)	-500 mL plastic bottle (PET 500) -rinse bottle and cap three times -fill to 2 cm from top -add 10 drops sodium hydroxide (NaOH) (Caution: NaOH is corrosive)
Mercury	-250 mL glass bottle -rinse bottle and cap three times -fill to top of label -add 20 drops each nitric acid (HNO_3) and potassium dichromate ($\text{K}_2\text{Cr}_2\text{O}_7$) (Caution: HNO_3 & $\text{K}_2\text{Cr}_2\text{O}_7$ are corrosive)

Phenols	-250 mL glass bottle -do <u>not</u> rinse bottle, preservative has been added -fill to top of label
Radionuclides (as scheduled)	-4 L plastic jug -do <u>not</u> rinse, carrier added -fill to 5 cm from top
Organic Characterization (GC/MS - once per year) (PBVOL), (PBEXT)	-1 L amber glass bottle; instructions as per organic -250 mL glass bottle -do <u>not</u> rinse bottle -fill completely without bubbles

Steps:

1. Let sampling water tap run for an adequate time to clear the sample line.
2. Record time of day on submission sheet.
3. Record temperature on submission sheet.
4. Fill up all bottles as per instructions.
5. Record chlorine residuals (free, combined and total for treated water only), turbidity and pH on submission sheet.
6. No smoking in area of sample location.

ii) Distribution Samples (standing water)

General Chemistry	-500 mL plastic bottle (PET 500) -rinse bottle and cap with sample water three times -fill to 2 cm from top
Metals	-500 mL plastic bottle (PET 500) -rinse bottle and cap three times -fill to 2 cm from top -add 10 drops nitric acid (HNO_3) (Caution: HNO_3 is corrosive)

Steps:

1. Record time of day on submission sheet.
2. Place bucket under tap and open cold water.
3. Fill to predetermined volume.
4. After mixing the water, record the temperature on the submission sheet.

5. Fill general chemistry and metals bottles.

6. Record chlorine residuals (free, combined and total), turbidity and pH on submission sheet.

iii) Distribution Samples (free flow)

General Chemistry	-500 mL plastic bottle (PET 500) -rinse bottle and cap with sample water three times -fill to 2 cm from top
Bacteriological	-250 mL plastic bottle with white seal on cap -do <u>not</u> rinse bottle, preservative has been added -avoid touching bottle neck or inside of cap -fill to top of red label as marked
Metals	-500 mL plastic bottle (PET 500) -rinse bottle and cap three times -fill to 2 cm from top -add 10 drops nitric acid HNO_3 (Caution: HNO_3 is corrosive)
Volatiles (duplicate) (OPOPUP)	-45 mL glass vial with septum (teflon side must be in contact with sample) -do <u>not</u> rinse bottle, preservative has been added -fill bottle completely without bubbles
Organics (OWOC)	-1 L amber glass bottle per scan -do <u>not</u> rinse bottle -fill to 2 cm from top
Polyaromatic Hydrocarbons (OAPAHX)	-1 L amber glass bottle per scan -do <u>not</u> rinse bottle -fill to 2 cm from top -add 25 drops of sodium thiosulphate

Steps:

1. Record time of day on submission sheet.

2. Let cold water flow for five minutes.

3. Record temperature on submission sheet.

4. Fill all bottles as per instructions.

5. Record chlorine residuals (free, combined and total), turbidity and pH on submission sheet.

